CANADA AT THE CROSSROADS

THE REALITY OF A NEW COMPETITIVE ENVIRONMENT

A STUDY PREPARED FOR
THE BUSINESS COUNCIL ON NATIONAL ISSUES
AND THE GOVERNMENT OF CANADA

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Thomas P. d'Aquino
President and Chief Executive
Business Council on National Issues
Canada

The Honourable Michael Wilson, P.C., M.P.
Minister of Industry, Science
and Technology and International Trade
Government of Canada

Gentlemen,

On behalf of myself and a team of dedicated and talented Canadians from Monitor Company, I am pleased to present to the Business Council on National Issues and the Government of Canada a synthesis of our report **CANADA AT THE CROSSROADS** - **THE REALITY OF A NEW COMPETITIVE ENVIRONMENT**.

We trust that our analysis and our findings will be helpful to decision-makers in all the constituencies in Canada concerned with building a more prosperous and competitive country.

A great number of Canadians have assisted us in preparing this study. Without their openness, insights and commitment, our task would have been impossible. We are grateful to them and to the generosity of the Business Council on National Issues and the Government of Canada for the financial support that made this study possible.

Michael E. Porter
Professor of Business Administration
Harvard Business School

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INTRODUCTION

This synthesis captures the essential elements of our study of Canadian competitiveness entitled **Canada at the Crossroads: The Reality of a New Competitive Environment**.* The study, initiated twelve months ago, was prepared for the Business Council on National Issues and the Government of Canada. Although the Business Council and the Government of Canada generously agreed to finance the study, it was undertaken as an independent research project. The findings and conclusions of the study, therefore, are those of the authors alone.

The project team for this study was mainly Canadian. Working under the direction of Professor Michael Porter, with assistance from other researchers drawn from his original ten-nation study published in 1990, the Canadian research team benefitted greatly from ongoing input from an Economic Advisory Group composed of ten leading Canadian authorities on competitiveness. Valuable input was also provided by government officials and the hundreds of representatives from the Canadian private sector who were interviewed during the course of the research.

The research for the study was conducted in three main phases. Phase one involved an in-depth analysis of Canada's patterns of trade and shifts in Canada's relative competitive position over time. Phase two consisted of a detailed historical and current analysis of 25 industries representing approximately 37 percent of total Canadian exports in 1989. The third phase of the research entailed an audit of the institutional and public policy environment in Canada and its impact on the way Canadian firms compete. Here, especially, we drew on existing Canadian literature in order to augment our own research.

* The full study, with its references to sources, will be available from the offices of the Business Council on National Issues in Ottawa.

This study makes no pretence of being exhaustive. Inevitably, we have emphasized the areas we believe to be most salient to Canada's competitiveness. Nor did we attempt to summarize or do justice to the extensive literature that exists on the Canadian economy, although we drew heavily from some parts of it. Our principal aim was to provide a holistic frame of reference with which to understand the many factors that influence Canadian competitiveness, and to highlight the areas where we believe the need for change is most pressing.

The full study report itself is divided into four parts. To ensure consistency, this summary document also has four parts.

Part I explains why Canadians should be concerned about the competitiveness of their economy, examines Canada's evolving position in international competition, and outlines the framework for analyzing the determinants of national competitive advantage originally developed in Porter's book, The Competitive Advantage of Nations (The Free Press, 1990).

Part II analyses the evolution and international competitive performance of 25 Canadian industries. A large number of industries were studied in order to represent the various regions of the country and the main sectors of the Canadian economy.

Part III examines the sources of Canadian competitive advantage, using the analytical framework developed in The Competitive Advantage of Nations. As described more fully below, this framework -- the "diamond" -- focuses on four broad national attributes that shape the environment in which a country's firms compete: i) factor conditions, ii) demand conditions, iii) related and supporting industries, and iv) firm strategy, structure and rivalry. The analysis provided in Part III draws upon the 25 industry studies, existing Canadian

research literature, and our own independent assessment of the Canadian public policy and institutional environment.

Part IV of the study pulls together the results of the research on Canadian competitiveness and identifies the key implications for firms, governments and other important constituencies in Canadian society.

PART I

CANADA AND INTERNATIONAL COMPETITION: THEORY AND EVIDENCE

1. SETTING THE CONTEXT

The principal economic goal of a country is to provide a high and rising standard of living for its citizens. By this yardstick Canada's economy has performed well over the last 30 years. It has achieved one of the world's highest standards of living while creating and maintaining a generous and socially progressive state. Adjusted for purchasing power, Canada ranked second among Organization for Economic Cooperation and Development (OECD) countries in per capita Gross Domestic Product (GDP) in 1989, up from fourth in 1960.

We believe, however, that Canada today is at an economic crossroads, and that the core of its economic prosperity is at risk. Canada's rich natural resource endowments, its proximity to the United States, and a history of insulation from international competition have combined to allow Canadian industry to achieve an enviable economic performance. These same advantages, however, have led to an array of policies, strategies and attitudes on the part of governments, business, labour and individual Canadians that leave the economy in many respects ill equipped to respond to a rapidly changing competitive environment.

Canadian industry now is undergoing a rapid structural change. As this process continues, signs are already accumulating that Canadian industry is encountering difficulties as it confronts a changed and more competitive environment. If the current trajectory continues, the standard of living of Canadians seems destined to fall behind.

Yet there is nothing inevitable about this outcome; Canadians have in their own hands the power to change it.

2. THREATS TO PROSPERITY

The underpinning of competitiveness, and thus of a country's standard of living, is productivity. Productivity is the value of output produced by a day of work or a dollar of capital invested. In the long run, productivity determines the standard of living by setting wages, profits, and ultimately the resources available to meet social needs. To achieve sustained productivity growth, an economy must continually upgrade itself. An upgrading economy is one that relentlessly pursues greater productivity in existing industries by improving products, utilizing more efficient production processes, and migrating into more sophisticated and higher value industry segments. It is also an economy that has the capability to compete in entirely new industries, absorbing the resources made available from improved productivity in existing industries. The capacity of an economy to upgrade -- its competitive potential -- depends on underlying structural and institutional characteristics, such as its workforce, its infrastructure, its post-secondary educational institutions, and its public policies. Cyclical factors, such as shifts in world commodity prices or exchange rates, can create the illusion of prosperity, but in reality yield only temporary advantages.

A. The Changing Competitive Environment

Traditionally, Canadians have lived in a relatively insulated environment brought about by paternalistic government policies, a history of market protection, and the accumulated attitudes and experiences of both individuals and businesses.

This old economic order, as we call it, was a system where many prospered. However, because the old order generally provided insulation from external pressures and fostered limited internal pressures, many of the critical requirements for upgrading to more sophisticated and sustainable competitive advantages in Canadian industry have been missing or are only weakly present.

Increasing globalization of trade and investment, accelerating technological changes, rapidly evolving company and country strategies, and -- more recently -- the Free Trade Agreement with the United States, represent significant discontinuities in the nature of international competition confronting Canadian-based industry. Together, these forces are pushing Canada away from the "comfortable insularity" of the old order. They will both magnify long-standing competitive weaknesses and hasten the pace of structural adjustment to a new competitive reality. What is most troubling is the fact that in essential areas such as science, technology, education and training, significant barriers stand in the way of effective upgrading.

Owing to Canada's extensive trading relationship with the United States and its unusually high degree of foreign ownership, the shifting character of international competition poses particularly daunting challenges for Canadian firms and public policy-makers. Many companies are currently in the process of determining how to reconfigure their North American and international activities, including deciding where to locate what we describe as their "home bases" for individual product lines and even their entire corporate operation. Typically, a company's home base is where the best jobs reside, where core research and development is undertaken, and where strategic control lies. Home bases are important to an economy because they support high productivity and productivity growth. In the context of the changing global economy, we believe that Canada is in danger of losing much of its capacity to attract and retain home bases.

So far, many industries and sectors show few signs of upgrading. In addition, as we discuss below, macroeconomic indicators have begun to manifest the weaknesses that exist at the industry level. Though Canada's status as a wealthy country is not in doubt, the risk is of a slowly eroding standard of living over the coming years.

B. Worrisome Performance Trends

Over the 1980s, Canada's economy performed quite well. Real economic growth between 1983 and 1989 was second only to Japan among the seven leading industrial countries (the G7). Canada also enjoyed the second fastest rate of employment growth among the G7 over the same period (the United States was first). Yet despite these favourable macroeconomic indicators, there is mounting evidence that Canada suffers from underlying economic weaknesses that could undercut its ability to achieve a higher standard of living in the future.

- The most serious weakness is low productivity growth. Since the early 1970s, Canada has ranked near the bottom of all major industrial countries in productivity growth. From 1979 to 1989, Total Factor Productivity (TFP) -- which measures the growth in productivity of both labour and capital inputs -- rose by a mere 0.4 percent per year, tying Canada with the United States as the worst performer among the G7 countries. Over the same period, manufacturing labour productivity growth in Canada was the lowest among the G7 countries, averaging only 1.8 percent per annum.

- A second and closely related concern is Canada's record in the area of unit labour costs. Unit labour costs measure labour costs adjusted for productivity. They are a key indicator of competitiveness, especially for industries and firms that produce tradeable goods and services. Between 1979 and 1989, Canada's unit labour costs in the manufacturing sector rose more quickly than those in most other industrialized

countries, and increased more than twice as fast as costs in the United States, which is the most important competitive benchmark for Canadian industry.

- Unemployment is a third danger signal. Despite robust employment growth over the past two decades, the unemployment rate in Canada has exceeded that in most other industrialized countries. In recent years, long-term unemployment has become more of a problem, and the average duration of unemployment has risen. Although the unemployment trend is a separate issue from that of productivity growth, growing numbers of workers with marginal or intermittent attachments to the labour force, and the rising average duration of unemployment, point to underlying problems that could affect Canada's capacity to upgrade its economy and respond successfully to changes in technology and global markets.

- Lagging investments in upgrading skills and technology. Canada's poor record in productivity growth and unemployment is disturbing. More worrisome in many ways, however, is that the investments that will drive productivity and employment growth in the future have been lagging. While aggregate investment growth has been quite strong, Canada trails competitor countries in private sector investments linked directly to enhanced productivity. Between 1980 and 1989, investment in machinery and equipment as a percentage of GDP was lower in Canada than in most other major industrialized countries. Similarly, Canadian private sector investment in research and development as a percentage of GDP is the second lowest among the G7 countries (slightly ahead of Italy). Moreover, investments by Canadian firms in worker training fall well short of levels registered in the United States, Germany, Japan, and many other advanced countries.

- Finally, the macroeconomic environment is not sufficiently supportive of investment. The ability of government to create a stable macroeconomic environment is being

hampered by chronic government deficits and rapidly growing public debt. Combined federal and provincial government debt has been growing more quickly than the economy for a decade and now exceeds 70 percent of GDP. Among the G7 countries, only Italy has a higher government debt level. Servicing these massive government debt obligations lowers Canadian income and places constraints on the ability of Canadian governments to maintain an environment that encourages investment and the upgrading efforts of Canadian industry.

3. CANADA'S POSITION IN INTERNATIONAL COMPETITION

This study provides a detailed examination of Canada's position in international competition between 1978 and 1989, and how this compares with the positions of other industrialized countries. Here, we can only summarize the key findings and conclusions that flow from this in-depth analysis.

A. Focus on the Traded Sector

A country's performance in the traded sector provides a unique window into the sources of national economic prosperity. The traded sector is a large and increasingly important component of the economies of all industrialized countries. It has particular leverage for productivity growth, especially in smaller and mid-size countries such as Canada, where the ability to trade frees productive local industries from the constraints of the domestic market. Thus freed, these industries can grow and absorb resources from less productive industries, whose products can then be imported. In addition, the traded sector is where firms from a multiplicity of countries compete. It is the place where one can best analyze the ways in which the economic context in different countries creates advantages or disadvantages for firms.

This study takes a detailed look at Canada's export sector. It explores Canada's position in international competition, both over time and relative to other industrialized countries. The basis for our statistical analysis is the United Nations Standard International Trade Classification (SITC) statistics. These trade statistics, which measure exports and imports in approximately 4,000 narrowly defined industries, allow us to compare the trade performance of many countries over time at the level of strategically distinct industries. The UN trade statistics were also used in the original ten-nation research reported in The Competitive Advantage of Nations.

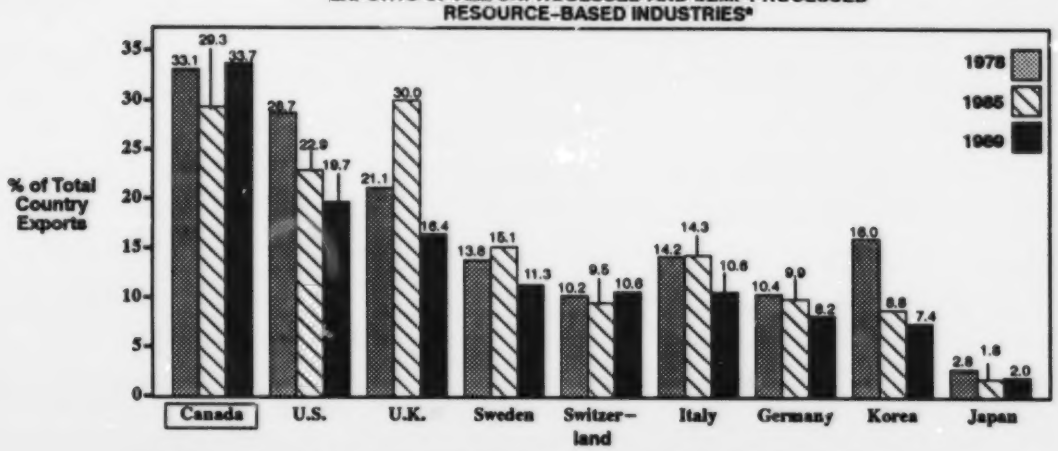
The export sector is a vital component of Canada's economy, representing 25.2 percent of GDP in 1989. Among the G7 countries, Canada is second only to Germany in the importance of trade to its economy. Canada's share of world market economy exports has varied between four and five percent over the past three decades. The trend for the period as a whole has been one of slow decline. More important than the trend in Canada's world export share, however, is how the composition of Canadian exports has evolved.

The remainder of this section summarizes the main characteristics of Canada's exports -- a subject explored at much greater length in the full study report.

B. Significant Natural Resource Dependence

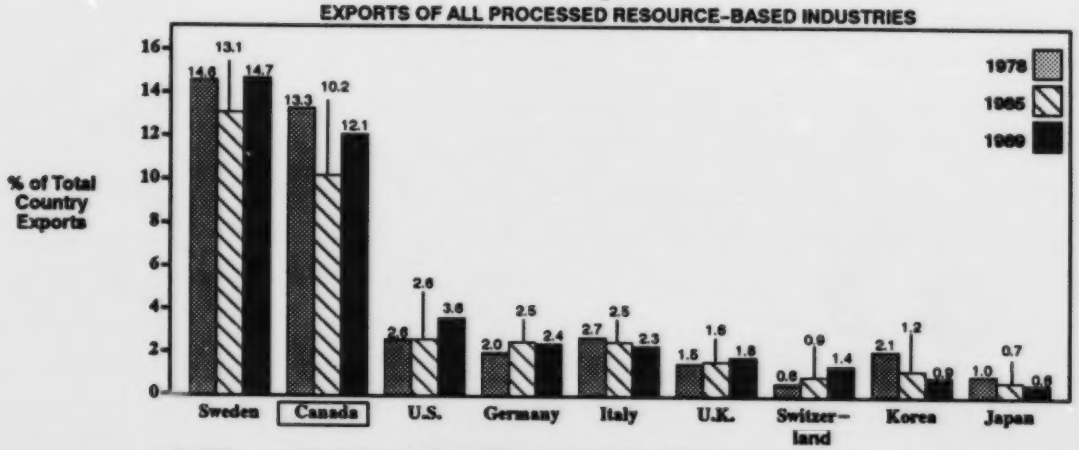
Perhaps the most striking feature of Canada's export profile is the prominent role of natural resource-based exports. These accounted for 45.8 percent of Canada's total exports in 1989. In fact, Canada's share of world resource exports rose from 4.9 percent in 1978 to 8.3 percent in 1989. Figures **1** and **2** compare the resource dependence of nine major trading countries. Of these, Canada has by far the largest share of country exports based on unprocessed and semi-processed natural resources; these comprised

Figure 1
EXPORTS OF ALL UNPROCESSED AND SEMI-PROCESSED RESOURCE-BASED INDUSTRIES*



*Note that the increase in unprocessed natural resource exports from the U.K. in 1985 is due to North Sea oil.
SOURCE: UN SITC TRADE STATISTICS (REVISION 2); MONITOR COMPANY ANALYSIS

Figure 2
EXPORTS OF ALL PROCESSED RESOURCE-BASED INDUSTRIES



SOURCE: UN SITC TRADE STATISTICS (REVISION 2); MONITOR COMPANY ANALYSIS

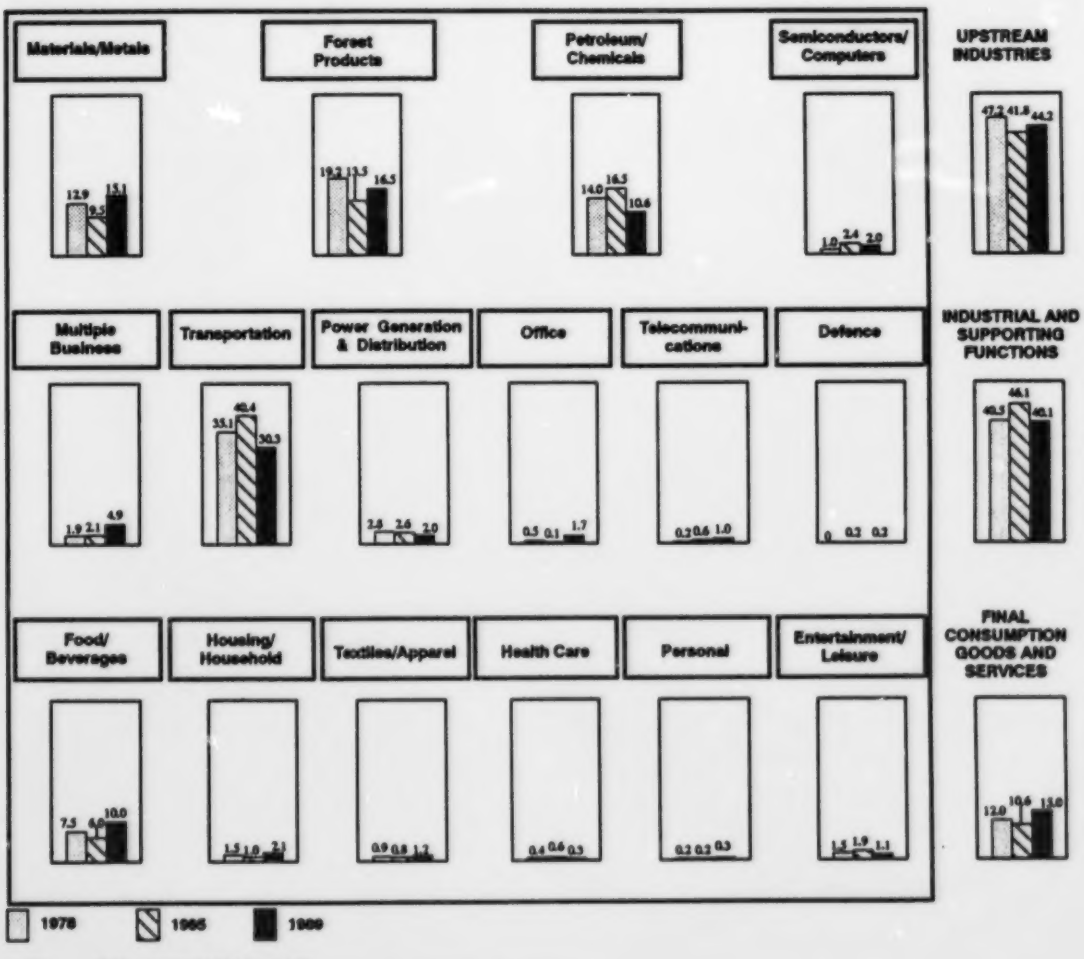
more than one-third of all Canadian exports in 1989, compared to 20 percent in the United States and 11 percent in Sweden.

Exports of natural resource-based products are by no means undesirable -- indeed, they have done much to make Canada wealthy. However, a high proportion of exports concentrated in relatively unprocessed resources suggests that, on the whole, Canadian industry has failed to upgrade or extend its competitive advantage into processing technology and the marketing and support of more sophisticated resource-based products. Dependence on semi- and unprocessed resources also leaves Canada vulnerable to commodity price shifts, technology substitution, and the emergence of lower-cost competitors, often in less developed countries. Why this pattern exists and what it means for the future is therefore a critical issue.

C. Exports Concentrated in Five Broad Clusters

Understanding the underpinnings of Canada's competitive advantage is aided by examining the nature of its industry clusters. To do this, all export industries are grouped into distinct clusters, as shown in the cluster chart in Figure **3**. The cluster chart consists of 16 clusters defined by end-use applications. Each cluster contains a number of distinct industries (with forest products, for example, consisting of market pulp, newsprint, sawmilling, and many other industries related to the forest sector). Upstream industries -- the four broad clusters across the top row of the figure -- produce inputs used by many other industries. Most upstream industries are resource-based, with the exception of semi-conductors/computers. Across the middle of the figure are six broad sectors connected to industrial and supporting functions. Industries at this level typically compete on the basis of technology and are often the industrial core of the economy. Along the bottom row are another six sectors associated with final consumption goods and services. Industries at this level are connected to end consumer needs. Resource-rich countries

Figure 3
PERCENTAGE OF ALL CANADIAN EXPORTS BY BROAD CLUSTER



Note: Totals may not add due to rounding
SOURCE: UN SITC TRADE STATISTICS (REVISION 2); MONITOR COMPANY ANALYSIS

typically begin at the top level of upstream industries, while resource-poor countries start from the bottom level of labour-intensive final consumption goods. Most gradually grow toward the middle (industrial and supporting) level of the chart as they upgrade and lay the foundation of an industrial core.

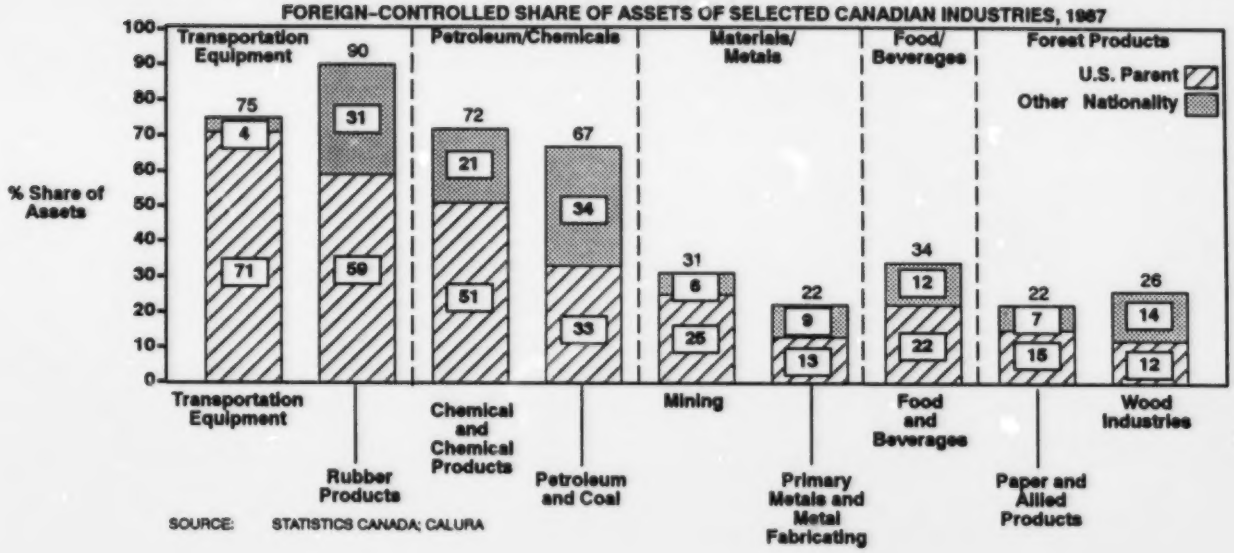
As shown in the figure, Canadian exports are highly concentrated in three of the 16 clusters -- materials/metals, forest products, and transportation, which together account for nearly 62 percent of Canada's exports. These three clusters, along with petroleum/chemicals and food/beverages, represented more than 82 percent of total Canadian exports in 1989. Looked at by end-use application, Canadian exports are concentrated at the level of upstream industries, where three of the five main clusters are located. At the level of industrial and supporting goods, Canadian exports consist largely of transportation equipment. Here we see the effect of the Canada-United States Auto Pact, which has had a profound influence on Canada's manufacturing sector (and, especially, its manufacturing exports). In 1989, fully 79 percent of transportation sector exports were from industries related to the Auto Pact. (Other cluster exports included aircraft and related parts and urban mass transit equipment.) Final consumption goods and services represent a relatively small share of Canada's exports (15 percent in 1989), the most significant cluster being food/beverage products which consists largely of minimally processed products such as fish and grain.

D. Key Role of Foreign-Controlled Companies

Foreign ownership is relatively high in Canada, although it has been declining since the 1960s. In the manufacturing sector, for example, approximately 45 percent of assets in Canada are foreign-controlled. Foreign ownership is quite widespread in most of Canada's five leading export clusters. Figure 4 shows the share of corporate assets controlled by foreign firms in selected industries within the various clusters. Among

Figure 4

FOREIGN-CONTROLLED SHARE OF ASSETS OF SELECTED CANADIAN INDUSTRIES, 1987



SOURCE: STATISTICS CANADA; CALURA

Canada's five main export clusters, foreign ownership is highest in transportation equipment and lowest in forest products. Many of the strategic decisions in important Canadian sectors are made, based on the overall global strategies of parent companies. How the choices made by these parent companies with respect to the location of home base activities for all or segments of their businesses will evolve in response to changes in international competition is a critical issue for the Canadian economy.

E. Very Limited Machinery Exports

Canada has few internationally competitive machinery industries. In total, machinery exports accounted for just 3.4 percent of all Canadian exports in 1989, up slightly from 3 percent in 1978, but substantially lower than in other major industrialized countries. In fact, Canada's share of competitive machinery exports fell from 1.3 percent of world

exports in 1978 to 0.7 percent in 1989.* In addition, Canada's trade deficit in machinery increased 31 percent in real terms since 1978, to US $ 3.3 billion.

Machinery industries are a sign of healthy economic upgrading. They give a country's core industries quicker access to and more control over fast-changing process technologies. Superiority in machinery and related and supporting industries can help to sustain competitive advantage in primary goods. Primary goods producers can often work closely with machinery firms located in their home country to upgrade and improve productivity. This relationship tends to be more difficult to build with foreign suppliers. In short, with few competitive machinery industries, many Canadian businesses are deprived of the dynamic interactions that foster process innovation and upgrading.

F. Principal Clusters Exhibit Limited Breadth or Depth

In looking in more detail, we find that even the most significant export clusters exhibit limited breadth or depth. For instance, in the forest products cluster, three industries: sawn wood, newsprint and market pulp, account for 75% of total exports. There is almost no export position in more sophisticated segments such as fine paper. Most significantly, in analyzing the patterns of change in export composition from 1978-1989, we see little evidence to suggest exports have shifted into more sophisticated industry segments within these clusters.

* The definition of international competitiveness employed in this study was consistent with that of the ten-nation study: a world export market share greater than Canada's overall share of market economy exports in 1989.

G. Few Service Industries are Internationally Competitive

Services represent about 68 percent of Canada's GDP and account for upwards of 70 percent of total employment. Among the G7 countries, Canada is second only to the United States in the relative size of the service sector. Although most services are not traded, they do represent a significant portion of the inputs of all goods exported by Canada. Uncompetitive domestic service industries can undermine the competitive position of a country's goods-producing sectors. The need for constant productivity improvements and upgrading thus applies equally to service industries, regardless of whether the output of such industries directly enters international trade.

International trade in services has been growing rapidly and now amounts to more than U.S. $700 billion per year (out of total world trade of $3.3 trillion). However, relatively few industries in the Canadian services sector have reached international standing and Canada's service exports as a percentage of total exports are the lowest of the G7.

H. Deteriorating Trade Balances Outside of Resource Sectors

Canada's overall mix of exports has remained quite consistent in the recent past, with resource-dependent industries maintaining a 45-46 percent share of total exports between 1978 and 1989. Four out of Canada's five dominant export sectors enjoy positive trade balances -- materials/metals, forest products, petroleum/chemicals, and food/beverages. (See Figure 5 for details.) As shown, Canada's strength in resource-based sectors is reflected in its growing positive trade balance in upstream industries, reaching $23 billion in 1989 (measured in U.S. dollars), up sharply from $9 billion in 1978. A rising trade surplus in the forest products sector (from $5.3 billion in 1978 to $16.4 billion in 1989) largely accounts for Canada's strengthening position in upstream industries.

Canada's trade balance is negative, however, in most of the 16 industry clusters shown in the figure. Overall, Canada has recorded growing trade surpluses in resource-dependent goods, and rising trade deficits in non-resource sectors. Higher deficits in most non-resource industries point to weaknesses in Canada's competitive profile. Imports are fulfilling Canadian demand in a growing range of sophisticated industry segments. Canada remains extremely dependent on exports of resource-based products (and transportation equipment) to sustain its wealth and standard of living.

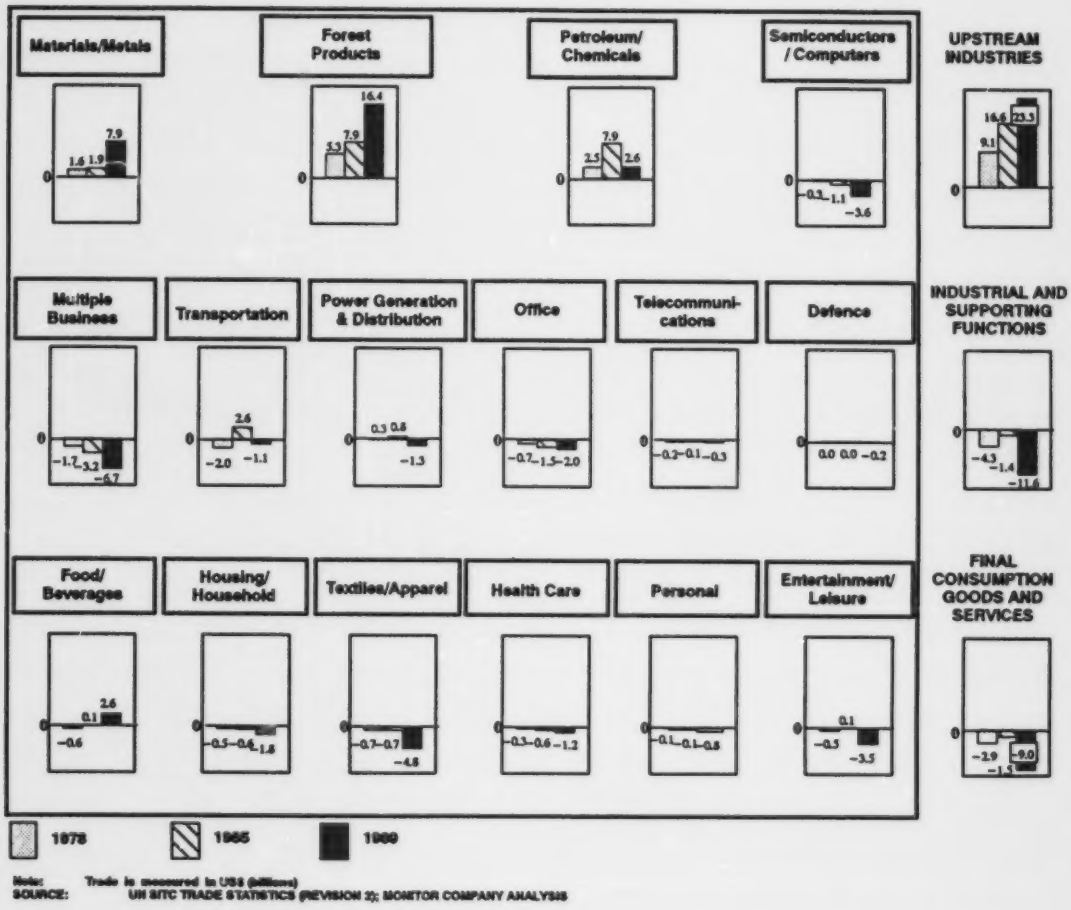
I. Export Economy Divided Into Four Main Categories

Looking closely at Canada's trade patterns suggests another way of picturing the Canadian economy. In particular, it is possible to divide the export sector into four broad industry groupings:

i) **Resource-based industries:** These are industries in which Canadian exports are derived wholly or largely from natural resource advantages. Pulp and paper, lumber, and copper are examples.

ii) **Market access-driven industries:** These consist of industries where Canadian exports come from plants established by foreign companies primarily to gain access to the Canadian market. Indicators used to identify such industries in our research were a high share of assets controlled by foreign companies, and/or historically high tariffs. Auto Pact industries are the most important example, and currently represent about 60 percent of all shipments from market access-driven industries. Other industries in this category are rubber products, commercial refrigeration, office and business machines, electrical appliances, and some areas of industrial chemicals.

Figure 5
CANADIAN TRADE BALANCE BY BROAD CLUSTER



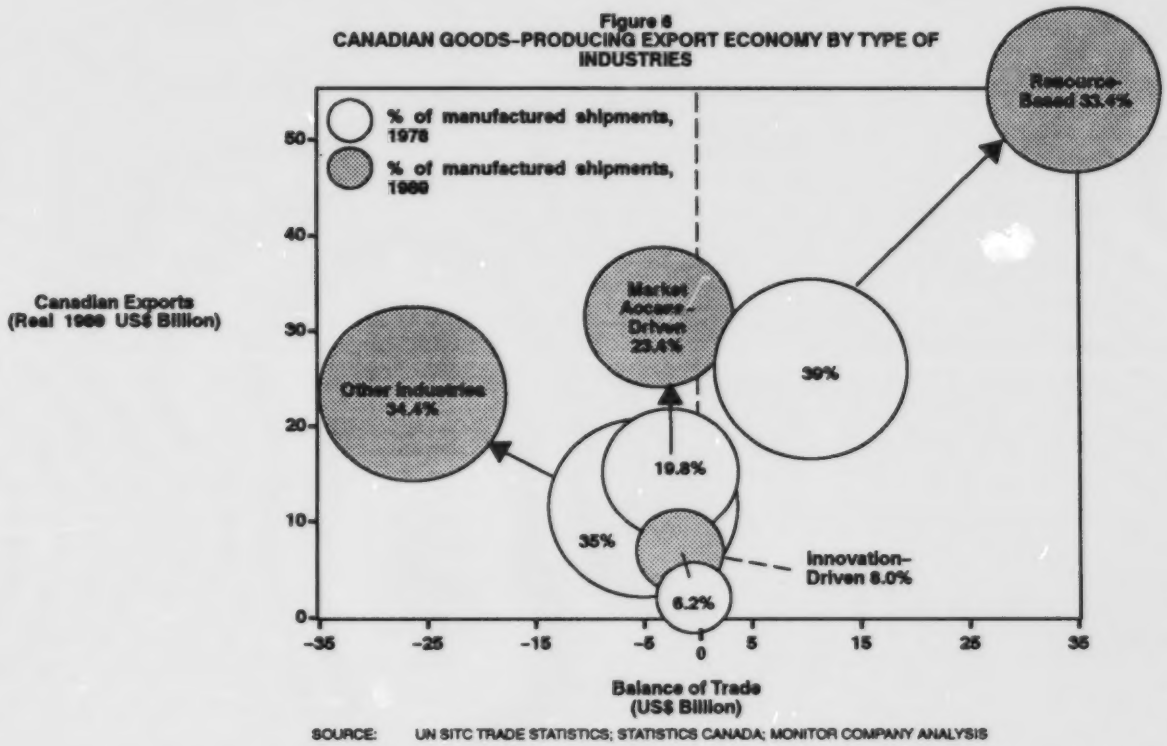
Note: Trade is measured in US$ (billions)
SOURCE: UN SITC TRADE STATISTICS (REVISION 2); MONITOR COMPANY ANALYSIS

iii) **Innovation-driven industries**: These are defined as either Canadian-owned, indigenous industries or foreign-owned industries where competitiveness has been driven largely by Canadian-based innovation. Manufacturing industries in this category include telecommunications equipment, aircraft and aircraft parts, and electronic components.

iv) **Other industries**: These represent the balance of Canada's export sector. Industries falling into this group tend to be uncompetitive or marginally competitive based on world export share. Industries in this group consist mainly of foreign-controlled firms with modest exports or indigenous industries involved in trade solely with bordering states of the United States.

To approximate how Canadian exports are divided into these groups, we used U.N. trade data. Unfortunately, this data covers goods- producing industries but not services. Canadian goods-producing industries were classified using the above categories, and the industries in each category were then aggregated (as measured by shipments). Figure **6** displays the trends by category in terms of exports and balance of trade. (Note that exports are valued in 1989 U.S. dollars.) The estimates are crude, but they are consistent with earlier data. As shown, the most significant growth in Canadian exports of goods between 1978 and 1989 was in the resource sector, which markedly increased its exports and its trade surplus over the decade. In the innovation-driven industries, exports have increased slightly and the trade balance is slightly negative, while in the market access sector, exports are up and the trade balance relatively steady. However, the size and trajectory of the "other industries" category is troubling. It is a significant part of the economy, but has been contributing to worsening trade balances. This again underscores the fact that the resource sector is the strongest part of the export economy.

Figure 6
CANADIAN GOODS-PRODUCING EXPORT ECONOMY BY TYPE OF INDUSTRIES



SOURCE: UN SITC TRADE STATISTICS; STATISTICS CANADA; MONITOR COMPANY ANALYSIS

J. Canada's International Competitive Position: Conclusion

This brief overview of Canada's position in international competition and its export economy highlights a number of real or potential weaknesses. Canada's high dependence on exports of relatively unprocessed natural resource-based products signals a lack of breadth even in the country's most prominent export clusters. Likewise, Canada's very weak position in machinery indicates a lack of depth within key industry clusters. Most importantly, our analysis found little evidence that either the breadth or the depth of Canada's major export clusters is increasing. Taken together, this evidence is consistent with the brief macroeconomic picture, previously presented, which points to an economy that shows limited signs of upgrading, and suggests that productivity growth -- the critical driver of prosperity -- may be increasingly difficult to achieve.

4. DETERMINANTS OF NATIONAL COMPETITIVE ADVANTAGE: THE "DIAMOND"

Competitiveness has emerged as a preeminent issue for firms and government policy-makers in every industrialized country. Most efforts to explain national competitiveness have taken an aggregate perspective, focusing on factor endowments, macroeconomic indicators, or government policies. Patterns of international trade have traditionally been explained within the framework of comparative advantage. The best-known variant of this theory begins with the premise that all countries employ equivalent technologies but differ in their endowments of so-called factors of production -- land, labour, natural resources, and capital -- which are the basic inputs of production. The traditional theory holds that particular countries gain advantage in those industries that make the most intensive use of the productive factors they have in abundance.

Recently, however, there has been a growing realization that traditional comparative advantage theory is no longer sufficient to understand the patterns of trade in modern international competition. Competition is becoming increasingly global in character. More and more firms are adopting a global perspective when making decisions about where to source raw materials, manufacture, and sell their products or services. This has the effect of "de-coupling" the firm from the factor endowments of a country. Raw materials, components, machinery and many services are now available to firms in most countries on increasingly comparable terms. The success of a firm is thus less and less dependent on endowments of basic factors in its home country.

With the trend toward globalization of industry, it is tempting to think that the individual country is no longer important to the international success of its firms, or even that countries have become irrelevant to international competition. Results from the ten-nation study, as well as from our study of Canadian competitiveness, strongly suggest that this

view is mistaken. Leading international competitors in a given industry are often located in the same country and often in the same city or region. The positions of countries in international competition tend to be surprisingly stable, stretching over several decades or even longer. This suggests that competitive advantage is created and sustained through a highly localized process, and that the attributes of particular countries do shape patterns of competitive success.

A. The Diamond of National Advantage

What is needed is a new paradigm that presents a consistent and holistic explanatory framework. This paradigm must explain several empirical facts. First, no one country is competitive in all or most industries; rather, countries are competitive in particular industries and industry segments. Second, each country exhibits distinct patterns of international competitive success and failure. Third, countries tend to succeed in clusters of industries rather than in isolated industries, and the pattern of competitive clusters differs markedly from country to country.

The principal conclusion from the ten-nation study is that sustained international competitive advantage results from ongoing improvement and innovation, not from static advantages. Here, innovation is defined very broadly, to encompass technology and the full spectrum of activities relevant to competing in the marketplace. Creating competitive advantage requires that its sources be relentlessly upgraded and broadened.

Against this backdrop, the critical questions then become: What is it about a country that supports high and rising levels of productivity in individual industries? In what ways does a country provide a dynamic environment for its firms? How do countries differ in the competitive environment created for their industries? The results of the ten-nation study suggest that the answer to these questions lies in four broad attributes of a country that,

individually and as a system, constitute the "diamond of national advantage." This can be thought of as the playing field that each country establishes for its industries and companies (see Figure 7). The four attributes are:

- **Factor Conditions:** The country's position in basic factors of production such as labour, land, natural resources, and infrastructure. Also included are highly specialized and advanced pools of skills, technology and infrastructure tailored to meet the needs of particular industries.

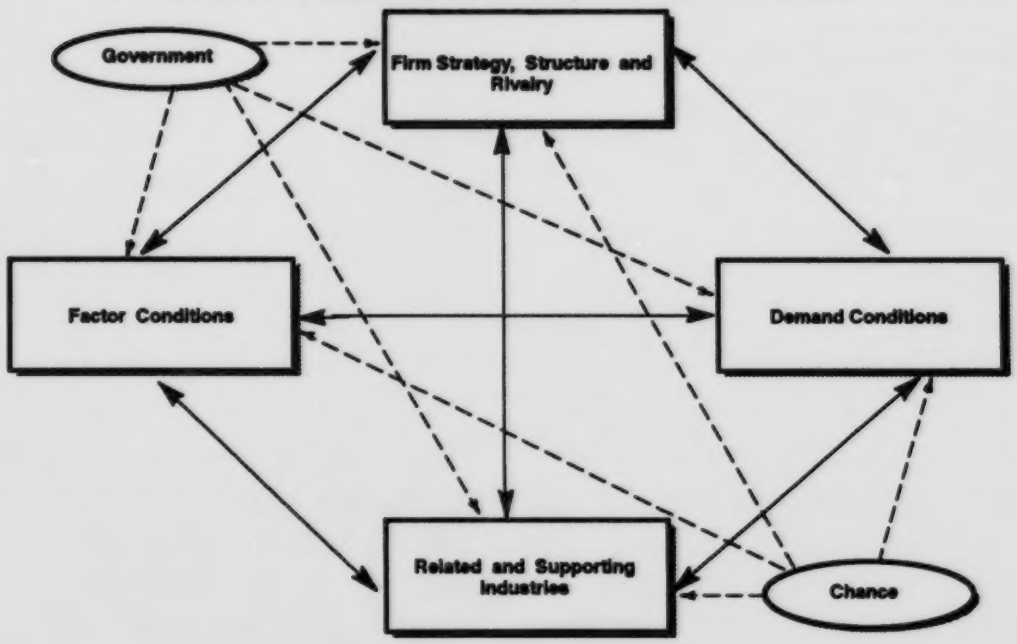
- **Demand Conditions:** The nature of home-market demand for the output of local industries. Particularly important is the presence of sophisticated and demanding local customers who pressure firms to innovate, and whose needs anticipate needs elsewhere.

- **Related and Supporting Industries:** The presence (or absence) in the country of supplier industries and other related industries that are internationally competitive. This determinant includes local suppliers of specialized inputs (e.g., machinery, components, and services) that are integral to innovation in the industry, as well as innovative local companies in industries related by technology, skills or customers.

- **Firm Strategy, Structure and Rivalry**: The conditions in the country affecting how companies are created, organized and managed, as well as the nature of domestic rivalry.

Two additional variables, government and chance, also influence the national competitive environment in important ways. Government policy is best understood by examining how it has an impact on each of the four determinants of competitive advantage included in the diamond. The role of government is analyzed by looking at its effects on factor

Figure 7
NATIONAL DETERMINANTS OF COMPETITIVE ADVANTAGE: "THE DIAMOND"



creation and the goals and behaviour of individuals and firms, its role as a buyer of goods and services, and its influence on the competitive environment through competition policies, regulation, and government ownership of enterprises.

Chance events are developments outside of the control of the country's government and its firms, but which affect the competitive environment. Examples include breakthroughs in basic technologies, external political, economic and legal developments, and international war and conflict. Chance events can create opportunities for a country's firms to acquire or strengthen competitive advantage.

B. The Diamond as a System

Each of the four determinants of competitiveness influences the capacity of a country's industry to innovate and upgrade. Together they constitute a dynamic system that is more important than its parts.

The ability to benefit from one attribute in the diamond depends on the state of others. The presence of sophisticated and demanding buyers, for example, will not result in advanced products or production processes unless the quality of human resources enables firms to respond to buyer needs. There must also be a climate that supports sustained investment to fund the development of these products and processes. At the broadest level, weaknesses in any one determinant will constrain an industry's potential for advancement and upgrading.

The four determinants are also mutually reinforcing. For example, the development of specialized supporting industries tends to increase the supply of specialized factors that also benefit an industry. Vigorous domestic rivalry also stimulates the development of unique pools of specialized factors. This is particularly likely if the rivals are all located in one city or region.

The diamond also bears centrally on a country's ability to attract mobile factors of production, a final form of mutual reinforcement. Mobile factors, particularly ideas and highly skilled individuals, are becoming increasingly important to international competitiveness. Mobile factors tend to be drawn to the location where they can achieve the greatest productivity, because that is where they can obtain the highest returns. The same features that make a country an attractive home base also help it attract mobile factors.

Advantages in the entire diamond may not be necessary for competitive advantage in low skill or inherently resource-dependent industries. Firms may also be able to penetrate the standardized, lower technology segments of more advanced industries without broad advantages in the diamond. In such instances, basic factor costs may be decisive. Competitive advantage in more sophisticated industries and industry segments, on the other hand, rarely results from strength in a single determinant. Sustained success in these industries and segments usually requires the interaction of favourable conditions in several of the determinants and at least parity in the others.

Geographic concentration also elevates and magnifies the interaction of the four determinants. It enhances the pressure from local rivalry and the frequency of spin-offs, works to stimulate and raise the sophistication of local customers, stimulates the formation of related and supporting industries, triggers greater local investment in specialized factor creation, and provides a magnet for mobile factors.

These same forces explain another important finding of the ten-nation study with particular relevance to Canada. There is often a marked disparity between the economic success of regions within countries. The striking difference between the industrial success of northern and southern Italy, northern and southern Germany, and eastern and central Canada are three such examples.

One manifestation of the systemic nature of the determinants is in the phenomenon of clustering. Clusters involve supplier industries, customer industries, and related industries that are all competitive. Such clusters are characteristic of every advanced economy - American entertainment, German chemicals, Japanese electronics, Danish foods. Countries tend to be successful in clusters of linked industries. It is rare that an isolated industry or firm achieves international success.

Clusters grow and transform themselves through spin-offs and diversification of firms into upstream, downstream and related industries and activities. The fields where several clusters overlap are often fertile grounds for new business formation. In Japan, for example, the interstices among electronics and new materials are spawning new competitive strengths in fields as diverse as robotics and screen displays.

Vital clusters of industries are often at the heart of a country's economic development, and especially its capacity to innovate. As suggested by the earlier trade analysis, however, the creation of more dynamic industry clusters represents a major challenge facing the Canadian economy.

C. Applying the Diamond in a Canadian Context

In applying this framework to Canada, four features of the Canadian economy must be addressed: the prominence of natural resource industries in Canada's exports, the role of rivalry in the relatively small Canadian market, the high degree of foreign ownership of Canadian industry, and the effects of Canada's location next to the huge United States market.

i) Natural Resources: Canada's economy, and especially its export economy, is heavily based on natural resources. Some argue that resource industries are inherently less desirable than manufacturing or "high-tech" industries. This logic is flawed. There is nothing inherently undesirable about resource-based industries, provided they support high levels of productivity and productivity growth. Such industries can make a country wealthy if its resource position is highly favourable, as has been the case for Canada during most of its history. If resource-based industries continually upgrade their sophistication through improvements in their processes and products, competitive positions can be sustained and productivity growth assured. In many resource-based

economies, however, resource abundance contributes to a set of policies, attitudes and institutions that reduce incentives to upgrade and make it difficult to move beyond the factor-driven stage of development. This can leave resource-based economies vulnerable to adverse shifts in technology, markets and international competition. The key test we must apply in appraising Canada's resource-based industries is their record in upgrading competitive advantage and their capacity for upgrading in the future.

ii) Domestic Rivalry: Domestic rivalry is critical to innovation and to the development of competitive advantage. Yet some commentators contend that Canada's relatively small market precludes the co-existence of strong Canadian-based rivals. Others argue that the proximity of the United States -- and thus of United States-based competition in the form of imports of American goods -- can compensate for limited rivalry at home. Previous research, however, has shown that vigorous domestic rivalry encourages international success not just in large countries, but also in small and mid-sized economies. The size of the Canadian market does not limit the size of Canadian firms and need not constrain domestic rivalry, as numerous examples drawn from small nations such as Switzerland, Denmark, Sweden and Taiwan attest. In global competition, scale is not limited by the size of the home market, and competitive firms export a large fraction of their total production. Indeed, local rivalry plays an important role in pressuring a nation's firms to export. The number of local firms needed for effective local competition will vary by industry, depending on economies of scale and other factors. In every country studied in the ten-nation research, some firms were found that had achieved a measure of international success without the benefit of local rivalry. Sometimes government policy has limited local competition in virtually all countries (as in telecommunications). Local rivalry may also be somewhat less important to competitive advantage in pure commodity businesses in which advantage derives from factor costs rather than innovation.

However, the great preponderance of evidence suggests that even here local rivalry plays a powerful role in competitive advantage. Weak domestic rivalry in many industries in Canada, then, will tend to diminish the odds of achieving sustained international success.

iii) Foreign Investment: There are three main types of foreign investment. Factor-sourcing investment typically seeks access to a country's natural resources, labour, or other basic factors. Foreign firms making such investments have their home bases outside of the host country. Market access foreign investment arises when companies are required -- for example, by tariffs or government regulations -- to develop a presence in a country in order to gain access to its domestic market. In these cases, too, the home base remains in the country of the parent firm. Most foreign investments in Canada have been motivated by a desire to source Canadian resources or gain access to the Canadian market.

The third, and most beneficial, type of foreign investment is that which establishes or acquires a home base for a particular business or business unit in the host country. In these cases, the management and other core activities are located in the host country, which signals that that country possesses true international competitive advantage in the industry. The home base is where the firm normally contributes the most to the local economy in a particular industry, by establishing the most productive jobs, investing in specialized factor creation, acting as a sophisticated buyer for other local industries as well as a sophisticated related and supporting firm for other industries, and helping to create a vibrant local competitive milieu.

Canada has witnessed a good deal of debate on the issue of foreign investment and its impact on the country's economy. Much of this debate has been wide of the mark. We believe that in most circumstances, a country is better off with foreign investment

than without it. And Canada, in our view, has been a net beneficiary. Foreign companies bring to the host country capital, skills and technology -- all of which boost productivity. Yet the pattern of foreign activities in Canada also signals circumstances that create vulnerabilities for the future. Though there are exceptions, few foreign-controlled firms have made Canada a home base for product lines.

As competition becomes more global and trade and investment barriers fall, the location of firm activities will reflect true economic advantage. The key challenge then is to create the conditions under which foreign -- and Canadian -- firms will want to locate home bases, and perform sophisticated activities, in Canada.

iv) The Importance of Canadian Diamonds Given North American and Global Competition: Canada and the United States share a lengthy, easily permeable border as well as many social and cultural attributes. Why, then, should we focus our attention on the Canadian diamond? Wouldn't it make more sense to look at the larger North American diamond, and ask how Canadian firms can take advantage of circumstances in the United States to achieve competitive success? The most basic reason to be concerned about the Canadian diamond is that Canada's standard of living largely depends on the activities that take place in Canada. The location of the most productive economic activities, especially home base activities, is determined by the health of the Canadian diamond in any given industry compared to other locations. And while there are many similarities between Canada and the United States, there are also significant differences -- in institutions, trading patterns, tax policies, customer behaviour, economic structure, and labour force composition, among other areas. It is these differences that serve to create distinctive Canadian diamonds in industries. Although the Canada-United States Free Trade Agreement is likely to lessen some of the differences between the two countries, it will also magnify the competitive impact of those that remain.

Competitive advantage tends to be highly localized within countries. Locations differ in the environment they provide for innovation and upgrading. Proximity to customers, suppliers, rivals, and sources of specialized factors is crucial to the innovation process. The geographic locus of competitive advantage can cross national borders. In the case of Canada, the relevant arena of competitive advantage for a particular industry may encompass adjacent parts of the United States. In addition, it makes sense for Canadian firms to reach into the United States diamond to strengthen their competitive position or overcome weaknesses in the Canadian diamond -- for example, by selling to and getting feedback from more sophisticated American customers. But Canadian firms can only take advantage of the United States diamond selectively. Basic factors and demand are easiest to access. In contrast, industry-specific infrastructure, a highly skilled workforce, and certain types of supplier and customer relationships are difficult for a country's firms -- including Canada's -- to source at a distance. In any case, accessing the United States diamond cannot provide Canadian firms with unique advantages relative to their American competitors -- at best it minimizes disadvantages.

In short, there is no single North American diamond in industries which allows us to ignore Canadian circumstances. Our attention must therefore be directed to the strength of Canadian determinants.

PART II

INDUSTRY STUDIES

1. OVERVIEW

The detailed analysis of 25 Canadian industries was one of the most important parts of the research undertaken for this study.* Several criteria were used to select these industries. We wanted to represent all of the main exporting sectors of the Canadian economy. We sought to examine both processed and unprocessed natural resource industries, both manufacturing and service industries, and industries characterized by high degrees of both foreign and domestic ownership. Some of the industries included in the study have been conspicuously successful in exporting to markets other than the United States. Others were once internationally successful, but have since experienced declining competitiveness. A few were included in part because of their significance to particular regions of the country (e.g., fish processing in Atlantic Canada, aluminum in Quebec).

Most of the 25 industries met the principal criterion of having (or having once had) a relatively high world export share -- the same criterion used to select industries in the original ten-nation research described in The Competitive Advantage of Nations. In Canada's case, an industry with relatively high world export share was defined as one in which Canada's export share in 1989 exceeded its proportion of total world market economy exports in that year (5.1 percent). This was taken as a sign that Canada had a competitive international position in the industry in question. Some of Canada's

* Four complete industry case studies are included in the full study report.

internationally successful industries have made significant investments abroad, and several of these were also included among the 25 examined in this study (e.g., central office switches, waste management). Canada has long been a recipient of large inflows of direct foreign investment, so it was decided to include some industries in which foreign investment and control has been high -- automotive assembly, styrene, and industrial explosives being three examples. Figure **8** lists the 25 industries analyzed in the study and the reasons for their inclusion.

The industry research undertaken for this study consisted of extensive interviews with industry participants, government officials and other experts, as well as a review of published and unpublished data and research. In each case, the objective was to diagnose the competitive position of the industry and understand the historical and present circumstances that have contributed to its success (or, in some cases, failure). Preliminary results of the research were presented to industry participants and government officials for comment and verification. The final judgments offered in the study, however, are our own.

2. PATTERNS IN THE INDUSTRY STUDIES

The resource-based industries studied included electricity, newsprint, market pulp, aluminum, Atlantic groundfish, styrene, nickel, beef processing, and manufactured housing. Competitive advantage for Canadian producers in these industries is drawn primarily from basic factor conditions, although the nickel industry, in particular, has been successful in developing advantage in advanced factors. Other elements of the diamond generally have not been very important in creating competitive advantage for Canadian firms in these industries.

Figure 8
INDUSTRIES SELECTED AND RATIONALE FOR SELECTION

INDUSTRY	HIGH SHARE OF WORLD EXPORTS	HIGH LEVEL OF CANADIAN DIRECT INVESTMENT ABROAD	HIGH LEVEL OF FOREIGN CONTROL	REGIONAL SIGNIFICANCE	SERVICE INDUSTRY
Newsprint	✓✓				
Market Pulp	✓✓				
Nickel	✓✓				
Aluminum	✓✓	✓	✓	✓	
Atlantic Groundfish	✓			✓✓	
Styrene	✓✓		✓	✓	
Electricity	✓✓				
Beef Processing			✓✓	✓	
Manufactured Housing	✓✓				
Auto Parts	✓✓		✓	✓	
Auto Assembly	✓		✓✓		
Pulp & Paper Equipment			✓✓		
Ice Skates	✓✓				
Urban Rail	✓✓	✓		✓	
Flight Simulators	✓✓	✓		✓	
Industrial Explosives		✓	✓✓		
Commuter Aircraft	✓✓		✓	✓	
Central Office Switches		✓✓			
Geophysical Contracting	✓				✓✓
Consulting Engineering	✓				✓✓
Whisky	✓✓	✓	✓		
Life Insurance	✓	✓		✓	✓✓
Human Biologicals	✓✓				
Waste Management		✓			✓✓
Radiation Therapy Equipment	✓✓				

✓✓ – Primary Consideration

✓ – Secondary Consideration

The market access-based industries studied included auto parts, automotive assembly and pulp and paper equipment. It was difficult to find sources of advantage specific to Canada in these industries.

Innovation-driven industries in Canada have drawn advantage from favourable conditions in several of the determinants. The roles of advanced factor creation, sophisticated domestic demand, and firm strategy, structure and rivalry were more pronounced in these industries than in others examined in the study. Industries in this group included ice skates, urban rail, geophysical contracting, central office switches, flight simulators, industrial explosives, commuter aircraft, consulting engineering, and life insurance. Human biologicals and whisky were included in this category because they were innovation-driven in the past; however the strength of their diamonds has eroded.

Industries in the other category were waste management and radiation therapy equipment. These industries have drawn moderate strength from a variety of determinants of competitive advantage, but they have relatively weak diamonds.

Figure 9 provides a summary assessment of the effects of the various determinants of competitive advantage on each industry included within the four broad groupings identified above.

Several distinct patterns emerged from the industry studies.

A. Advantages in Basic Factors

Many of the industries examined have depended on basic factor conditions to provide competitive advantage; few have displayed an ability to create the more advanced and specialized factors that are increasingly necessary to achieve long-term competitive

Figure 9
SOURCES OF INTERNATIONAL COMPETITIVENESS IN SELECTED CANADIAN INDUSTRIES

INDUSTRY	FACTOR CONDITIONS	DEMAND CONDITIONS	RELATED AND SUPPORTING	STRATEGY, STRUCTURE & RIVALRY	ROLE OF GOVERN-MENT	ROLE OF CHANCE	% SHARE OF WORLD EXPORTS 1989
RESOURCE-BASED							
Newsprint	(B) High	Low	Low	Low	Low	-	60
Market Pulp	(B) High	Low	Low	Low	Low	-	33
Nickel	(B&A) High	Low	Moderate	Moderate	High	-	60
Aluminum	(B) High	Low	Low	Low	Moderate	High	18
Atlantic Groundfish	(B) High	Low	Moderate	Low	Negative	-	8
Styrene	(B) High	Moderate	Moderate	Low	Low	-	18
Electricity	(B) High	Moderate	High	Moderate	High	-	15
Beef Processing	(B) Moderate	Moderate	Low	Low	Moderate	-	1
Manufactured Housing	(B) High	Moderate	Low	Low	Moderate	-	5
MARKET-ACCESS BASED							
Auto Parts	Low	Low	Low	Low	High	-	10
Auto Assembly	Low	Low	Low	Low	High	-	10
Pulp & Paper Equipment	Low	Low	Moderate	Low	Low	-	11
INNOVATION-DRIVEN							
Ice Skates	(A) Moderate	High	High	High	Low	-	80
Urban Rail	(A) Moderate	Moderate	Moderate	Low	Moderate	Moderate	7
Flight Simulators	(A) Moderate	Low	Low	Moderate	Low	-	22
Industrial Explosives	(B) Moderate	High	Moderate	Moderate	High	-	n/a
Commuter Aircraft	(A) Moderate	Moderate	Moderate	Low	Moderate	Moderate	10
Central Office Switches	(A) High	High	Moderate	High	Moderate	Moderate	15
Geophysical Contracting	(A) High	Moderate	High	High	High	-	80
Consulting Engineering	(A) Moderate	High	Low	High	High	-	n/a
Whisky	(B&A) Moderate	Low	Low	Moderate	Negative	High	12
Life Insurance	(A) Moderate	Moderate	Low	High	High	-	10
Human Biologicals	(A) Moderate	Low	Low	Low	Moderate	Moderate	n/a
OTHER							
Waste Management	(A) Moderate	Moderate	Low	Low	Low	Moderate	n/a
Radiation Therapy Equipment	(A) Moderate	Low	High	Low	High	-	30

(B) Advantage stems from basic factor conditions

(A) Advantage stems from advanced factor conditions

success in international markets. Market pulp, newsprint, and Atlantic fish processing are examples of Canadian industries that have relied on basic factor endowments for their international competitive success.

Our research found that few of Canada's resource-based industries have upgraded or widened their sources of advantage. Historically, relatively inexpensive factor inputs allowed Canadian firms to earn high profits by supplying unprocessed or semi-processed goods. With strong cost positions vis-à-vis rivals in other countries, Canadian firms were able to meet world prices without having to invest heavily in the latest process technology, to upgrade to higher value products, to invest in skills development, or to utilize labour efficiently. There are, however, some exceptions to this pattern among Canada's resource industries. Nickel producers, for example, have upgraded in a number of factor areas because of the impetus provided by intense competitive pressures. Some other resource industries are beginning to follow the same path, albeit often slowly and unevenly.

B. Risk-Averse, Inward-Looking, Cost-Based Strategies

An orientation toward basic factor advantages has led many Canadian-based firms in many of the resource industries studied to follow cost-based strategies premised on static views of cost, rather than investing in new technologies in order to improve their cost position.

In non-resource-based industries, high tariff barriers have resulted in many firms relying almost exclusively on the Canadian market for large portions of their product line. At the same time, firms have been prone to proliferate products and diversify widely to take greater advantage of the protected and profitable Canadian market.

Most industries -- particularly outside of the resource sector -- that do export are oriented primarily to the United States rather than to broader global markets. Because of this inward focus, many Canadian firms have not reaped the benefits that flow from keen attention to international developments in technology and markets, and have not felt pressure from world-class competitors or extremely demanding buyers to improve productivity or produce higher value products.

A limited number of Canadian industries, mainly in the resource sector, have adopted more global strategies. For the most part, these strategies have involved exploiting basic factor endowments. In the case of nickel, which represents a notable exception, advanced process technology has been developed and deployed in the form of vertical retreat mining. In aluminum smelting, Canadian firms have forward-integrated into higher value consumer and industrial goods, though much of the production is done outside of Canada. Among the resource industries studied, Canadian producers of aluminum and nickel have adopted the most global outlook. In other industries, outward-looking strategies have often arisen as a result of limited or saturated domestic demand. Canadian life insurers have a significant export orientation with as much as 40 percent of revenues derived from foreign operations. CAE Electronics, the world leader in flight simulators, is one of the few examples of an aggressive competitor with an outward-oriented, differentiation-based strategy.

C. Lack of Intense Canadian Rivalry

In many industries studied, Canada has lacked intense domestic rivalry. This further blunted pressures for upgrading. Weak rivalry in the domestic market reflects the existence of historically weaker competition regulations, a protected market and high concentration ratios in many industries. In some industries, firms have often worked co-operatively with one another in R&D ventures and have shared technology rather than

strived for innovation leadership. For example, pulp and paper companies in Canada have not considered technology to be an important source of advantage and have been quite willing to share technological developments.

In fact, domestic rivalry contributed importantly to competitive advantage in few of the industries we studied. Exceptions to this pattern were found in several innovation-driven industries. Geophysical contracting, consulting engineering and ice skates are all examples of internationally successful Canadian industries in which fierce domestic rivalry has been a source of competitive advantage for Canadian participants.

Northern Telecom is sometimes cited to illustrate that domestic rivalry is unnecessary in Canada. In fact, the Northern Telecom case proves the rule. Given government intervention around the world, there has been effectively no domestic rivalry in any country, including the United States. Northern Telecom, with some direct and indirect local competition, was an exception. At the same time, Canadian policies which created several private telecommunications service providers have led to demand side pressures to innovate almost unique to Canada.

D. Limited Advanced and Specialized Factor Creation

Facing only limited pressures to upgrade and innovate, Canada has developed relatively few advanced factors or specialized factor creation mechanisms. For the most part, Canada has not demanded, invested heavily in, created or adopted the most advanced technologies. Relatively low levels of R&D investment in many industries compared to leading foreign competitors are a sign of Canada's weakness in the area of factor creation. Further evidence can be seen in the low value and prestige generally associated with technical training and expertise in Canada, and in emerging skill shortages in advanced manufacturing industries such as aircraft and automotive assembly. Developing

advanced factors in some industries is hindered by the small number of specialized technical programs that exist at universities and colleges. Although pulp and paper, for example, has long been one of the country's most important industries, there are very few specialized educational programs devoted to meeting the industry's needs for highly skilled employees.

Exceptions to this general pattern of weak factor creation mechanisms are found in a number of Canadian industries, particularly in innovation-driven industries in which advanced and specialized factor creation has taken place. Canstar, the leading competitor in the ice skate industry, has developed leading-edge blade and boot technologies through a consistent focus on R&D. CAE Electronics' world-leading international position in flight simulators is attributable to its exceptionally strong commitment to R&D. Several firms in the Canadian consulting engineering industry have enhanced their human resource capabilities through skilled training programs on internally developed computer aided drafting and design (CADD) systems.

Factor creation is particularly effective when multiple institutions and firms operate in close geographic proximity. For example, the nickel industry has benefitted from the clustering of certain research and development activities, educational institutions and the Ontario Government's Ministry of Northern Development and Mines, in the Sudbury area.

Canadian firms in industries such as central office switches and urban mass transit have invested heavily in R&D, taken advantage of specialized engineering programs, and collaborated with governments and universities to create advanced and specialized factors. Northern Telecom's international competitive position in central office switches has been supported by its strong commitment to internal training. More recently, government, universities and the telecommunications industry have co-operated in establishing three new institutions devoted to providing specialized graduate training and

fostering world-class research in telecommunications. The objective is to build on Canada's existing specialized knowledge base in telecommunications in order to sustain its international competitive advantage in this sector.

E. Lack of Cutting-Edge Home Demand

Domestic demand conditions in many of the industries studied have rarely been unusually sophisticated or anticipatory. Buyers have generally provided little pressure for firms to upgrade their sources of advantage and have often reinforced factor dependence. In fact, an overall lack of leading-edge demand likely helps to explain the mix of Canada's most competitive industries -- industries in which sophisticated demand is generally less critical to success.

Since many Canadian firms have not been at the forefront in either creating or adopting world-class technologies, they have tended not to be overly sophisticated buyers. As a result, several examples were found of Canadian companies locating product trials or launch customers outside of the domestic market. CAE sold its first digital flight simulator to Swiss Air. The launch customer for the Canadair 50-seat Regional Jet is a German commuter airline, not a Canadian carrier. In other industries, such as pulp and paper equipment, Canadian producers have found it easier to sell applications of new technology abroad because Canadian buyers tend to want proven, existing technology.

Exceptions to this pattern do exist. Challenging mining conditions have long put Canada at the forefront of sophisticated requirements for explosives. The Canadian consulting engineering industry developed to service large, government-funded infrastructure projects commissioned to overcome the natural hardships of climate, scale and physical terrain. Both the geophysical contracting and central office switch industries in Canada also

derived competitive advantage from sophisticated domestic buyers of their products and services.

F. Weaknesses in Related and Supporting Industries

Our research found that few Canadian industries have obtained significant competitive advantage from healthy indigenous related and supporting industries. Related and supporting industries are underdeveloped in Canada in part because some leading firms have chosen to vertically integrate -- as in flight simulators -- or else because supply inputs are sourced from abroad (most notably the United States). Many foreign-owned industries in Canada have long sourced inputs from abroad; examples include commuter aircraft and automotive assembly. However, several industries studied which have high levels of Canadian ownership also source critical components, skills and technologies from outside of Canada; newsprint and whisky being notable examples. Weakness in related and supporting industries is both a cause and a result of Canada's lack of a vibrant domestic machinery and equipment sector.

The lack of related and supporting industries reflects the buyer behaviour of Canadian companies, the absence of specialized skills and technology so important in machinery and sophisticated components and services, and limited new business formation in manufacturing. Without related and supporting industries, in turn, we observe less overall investment in specialized factors.

3. IMPACT OF GOVERNMENT AND CHANCE EVENTS

Governments in Canada have often had a detrimental effect on the competitiveness of Canadian industries. Traditionally, Canadian governments have exhibited a paternalistic

outlook in their management of the economy, often seeking to insulate the Canadian economy from international competition through such mechanisms as high tariffs, subsidies, government ownership, and other interventionist policies. Government has been a protector, an agent of economic development, and a generous provider of goods and benefits. Only infrequently has government in Canada aggressively pressed firms to innovate, upgrade competitive advantage and meet high standards.

Extensive government involvement in industry rarely equates with competitive success. The Atlantic groundfish industry offers an extreme example of governments affecting the competitiveness of a Canadian industry, in this case for the worse. Their preoccupation with maintaining employment has worked against efficiency in the processing sector and encouraged the development of an inefficient in-shore fleet.

In a few of the industries studied, governments have tended to respond to, and reinforce, the types of company strategies and modes of behaviour described earlier. For example, historically weak environmental standards have been one of the factors contributing to a lack of upgrading in the newsprint industry; this also holds true for the market pulp industry. On the other hand, government has also played a positive role in fostering competitive advantage. The out-sourcing policies of Hydro Quebec stimulated the establishment and growth of internationally competitive Quebec-based consulting engineering firms. Strict financial regulations helped to create a strong life insurance industry in Canada. Similarly, Canadian governments' stringent safety regulations contributed to the emergence of an internationally competitive Canadian explosives industry.

Chance events have influenced the development of a number of successful Canadian industries. The Canadian aluminum, whisky and central office switch industries all benefitted from geographic proximity to the United States and from particular events in the

United States legal system. In aluminum, the leading Canadian firm in the industry, Alcan, was initially a subsidiary of the United States company, Alcoa. The break-up of Alcoa in 1928, under a American court ruling, allowed Alcan to become an independent company. Similarly, the introduction of Prohibition in the United States spurred the development of a competitive Canadian whisky industry. Finally, the creation of the modern Northern Telecom resulted from a 1956 United States court decision that required the American firm Western Electric to license its technology and sell its minority stake in Northern to Bell Canada.

4. THE OLD ECONOMIC ORDER

The patterns that we find in the industry studies are reflections of a distinctly Canadian economic system. The aspects of this old order are interrelated and internally consistent. Reliance on basic factors has led to limited factor creation. Firm strategies and government policies have tended to reinforce this reliance, limit the sophistication of Canadian demand, and reduce the degree of rivalry in the domestic market. This, in turn, has hindered the development of world-class related and supporting industries.

This old economic order produced a highly prosperous economy. In general, there were high profits for companies, high wages for workers, and security for managers. Government revenues were ample to support a generous social system. Different constituencies battled over their share of the economic rents generated by the system. Satisficing rather than optimizing behaviour became common. The behaviour of each major constituency was rational but reflected the old paradigm.

While the old economic order has been a stable one for decades, we would argue that it was an equilibrium in which significant potential wealth was lost to inefficiency in the

system. The price was limited international competitiveness outside of the resource sector, a lack of dynamism in the economy, and often higher than necessary prices in the domestic market.

PART III

ANALYZING THE SOURCES OF CANADIAN COMPETITIVE ADVANTAGE

Overall, our analysis of the determinants of competitive advantage suggests that, apart from strong basic and general factor advantages, Canada has few consistent patterns of strength among the other determinants. The remainder of this section highlights the state of the determinants identified earlier: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. For each determinant, government's impact is also considered. Given space limitations, this document provides only a brief summary of the body of information on Canadian determinants contained in the full report.

1. FACTOR CONDITIONS

A. Background

All countries compete with a mix of basic and advanced factors. Basic factors are those that are passively inherited or created through moderate investment. They include natural resources, climate, and unskilled and semi-skilled labour. Advanced factors are developed through sustained and sophisticated investment in both human and physical capital. Examples include modern digital data communications infrastructure and world-class university research institutes.

Another vital distinction is between generalized and specialized factors of production. Generalized factors are those that can be employed in a wide range of industries, such as a highway system, a pool of debt capital, or a cadre of college graduates. Specialized

factors, in contrast, are those that are particularly relevant to one or a limited range of industries, such as an optics research institute or a port specialized to handle newsprint.

A principal finding of the ten-nation study -- confirmed in the Canadian research -- is that the most significant and sustainable competitive advantage results when a country possesses factors necessary to compete successfully in a particular industry which are both advanced and specialized. The factors most important to modern industrial competition and to national prosperity are created, not inherited. A country's stock of factors at any point in time is less important than the rate at which they are created, upgraded, and made more specialized to particular industries. Those countries that continually invest in the creation of advanced and specialized factors are often able to translate these investments into sustained competitive advantage.

B. Canada's Record

Physical Factors: Factor conditions have played a pivotal role in the development of the Canadian economy and in the evolution of Canadian industry. Blessed with a rich abundance of natural resources, firms in Canada have drawn on these basic factors to establish many internationally competitive, resource-based industries. Only in relatively few instances, however, have advanced factors been a source of international advantage for Canadian firms. Indeed, advanced factor creation remains an area of weakness for Canada.

Canada's physical resources are its most significant source of international competitive advantage. These physical resources include a wide variety of renewable and non-renewable resources encompassing arable and forested land, minerals and metals, and fisheries and energy.

Basic physical infrastructure -- notably transportation and communications systems -- is well developed, although in most cases it does not confer unique competitive advantages. However, the productivity of some of Canada's infrastructure-related services, such as trucking and railways, has been hampered by extensive government regulation and ineffective co-ordination of government policies. Specialized infrastructure, which typically yields more sustainable competitive advantages for particular industries, is far less developed in Canada than basic infrastructure. Most of the specialized infrastructure projects developed in Canada have focused on resource industries. Little specialized infrastructure exists outside of the resource sector.

Human Resources: In the crucial area of human resources, Canada is facing tough challenges. Education spending is very high by international standards, as is the proportion of the population with at least some post-secondary education. However, a host of weaknesses are also apparent and detract from these favourable aggregate indicators. For example, Canada's overall illiteracy rate stands at 24 percent, and more than 30 percent of young people drop out of school before receiving high school diplomas. The level of advanced skills in Canada -- critical to sustaining and upgrading sources of competitive advantage for Canadian industry -- is inadequate. There are shortages of skilled labour in a variety of occupational sectors that require advanced training, especially in technology-related occupations. Post-secondary enrolment in science and engineering disciplines has been declining in recent years. Major employers such as Ontario Hydro and Northern Telecom forecast severe shortages of engineers in the coming decade.

Institutional and broad societal biases appear to be limiting Canada's ability to attract sufficient numbers into high skill- and technology-intensive occupations. Occupational standards for skilled trades are poorly developed, reflecting a strong social and cultural bias toward university-educated, white-collar occupations. Technical and vocational schools -- extensively used in many other countries to provide intensive skills training --

are widely perceived to be "second best" in Canada. The creation of advanced factors in the area of human resources is further hampered by low levels of industry involvement and co-operation with educational institutions, a lack of flexibility among post-secondary institutions, and government funding policies for post-secondary education that discourage specialization and inhibit the development of relatively costly programs in science, engineering and technology fields.

A further problem is the weak commitment to ongoing skill training on the part of Canadian private sector employers. Per capita expenditures on formal training by Canadian employers in 1987 were only one-half of the level in the United States and less than one-quarter of that in Germany. Human resource development in Canadian industry is also rendered less effective because of an often adversarial industrial relations climate. In many industries, the behaviour of both management and labour has been shaped by a narrow, short-term definition of self-interest. Fortunately, however, more constructive approaches to labour-management relations are gaining ground in some industries and firms. Co-operative efforts to expand training and improve workplace relations have emerged in the forest products, steel and electrical and electronic industries, among others.

Science and Technology: Canada's performance in the area of science and technology reveals some significant weaknesses. Private sector expenditures on research and development rank second lowest among the G7 countries. The prominent role of resource industries in the economy and Canada's extensive dependence on foreign investment do not adequately explain this relatively low private sector R&D spending. In comparing international R&D spending in selected resource industries, for example, it is apparent that Canada lags well behind its principal foreign competitors. The Canadian pulp and paper industry spent the equivalent of 0.3 percent of sales on R&D in 1988, while the industry in Sweden, Japan and Finland spent between 0.8 and 1.0 percent of sales.

Canada also trails other industrialized countries in the creation and adoption of new technologies. A major international survey in 1991 ranked Canada last among major OECD countries in the efficiency of firms in seeking out and exploiting new technologies. Poorly developed links in Canada between industry, universities, and publicly funded research institutes help to explain this pattern.

Capital Resources: Canada boasts a sophisticated and smoothly running capital market and financial system. Accessing funds has not been a problem for most companies and industries. However, difficulties in obtaining capital appear to have limited the growth and upgrading of some small and medium-sized firms, particularly in technology and "knowledge-intensive" industries. Also worrisome is that while the cost of capital in Canada has historically tended to mirror that in the United States, in recent years it has been well above United States levels, which itself is high in relation to some other countries such as Japan and Germany.

2. CANADIAN DEMAND CONDITIONS

A. Background

Companies that gain competitive advantage in sophisticated industries and industry segments often benefit from having domestic customers who are among the world's most demanding buyers of their products or services. Such buyers provide a window on advanced customer needs, pressure companies to meet high standards, and encourage them to improve, innovate and upgrade into more advanced segments. In the ten-nation study, favourable home demand conditions were found to have had some influence on competitive advantage in the vast majority of industries studied. Countries frequently gain competitive advantage in industries where the nature of home demand gives companies

a superior or earlier understanding of emerging buyer needs. Despite the globalization of competition, home demand conditions remain critical to competitive advantage in most of the international industries studied.

B. Canada's Record

Consumer Demand: Overall, Canadian demand conditions have not put strong pressure on firms to innovate, upgrade or anticipate international needs. Despite high levels of consumer spending power and education, coupled with Canada's proximity to the United States, Canadian industries have not typically been driven by demanding domestic customers to seek higher order competitive advantages. Canadian buyers are rarely at the leading edge in demanding innovative consumer goods. They are also reluctant -- at least compared to American consumers -- to voice complaints or to utilize consumer advocacy agencies to pressure providers of goods and services to enhance their products.

Industrial Demand: Industrial demand in Canada has also done little to encourage upgrading among Canadian firms. The low-cost orientation of many Canadian industrial buyers has constrained the scope for innovation across a range of industries, including pulp and paper, automobiles, and health care industries. Conservative patterns of technology adoption have forced Canadian producers of some innovative products and technologies to turn to foreign markets for their initial sales.

3. RELATED AND SUPPORTING INDUSTRIES IN CANADA

A. Background

World-class related industries can provide a county's firms with sources of technology, ideas and skilled employees that are advantageous in international competition. World-

class local supporting industries often deliver the most cost-effective or highest quality inputs in an efficient manner. Suppliers and end-users clustered together in the same geographic area can reap benefits from short lines of communication, a quick and constant flow of communication, and an ongoing exchange of ideas and innovations. In short, geographically clustered related and supporting industries create powerful spill-over effects that spur innovation and enhance competitiveness.

An absence of competitive related and supporting industries reduces the likelihood that a given industry will enjoy competitive advantage. Failure to develop related and supporting industries is often symptomatic of limited investments by a core industry in creating advanced and specialized inputs. A country's failure to develop or nurture world-class related and supporting industries may eventually put its existing clusters of internationally competitive industries at risk.

B. Canada's Record

Canada's industry clusters are generally both narrow and shallow, reflecting a very limited presence of indigenous related and supporting industries. Only rarely during our industry studies did we find an internationally successful industry whose competitive position was sustained or enhanced by the presence of strong related and supporting industries in Canada. In many Canadian industries, key supply inputs -- especially machinery and equipment -- are sourced from foreign suppliers.

In the forest products sector, for example, roughly half of Canada's pulp and paper equipment is sourced from abroad, while a majority of the domestic suppliers are foreign-owned and do not have Canadian home bases. The transportation equipment cluster, however, did reveal a stronger presence of competitive Canadian related industries, including auto, truck and bus assembly; railway locomotive assembly; snow-related

equipment; and commuter aircraft and helicopter manufacturing. Other competitive industries linked to aircraft are flight simulators and navigational instrumentation. Once again however, most of the specialized machinery is sourced abroad.

The general weakness of Canadian related and supporting industries can be traced to several factors, including a marked tendency to source from abroad (in the case of foreign-owned firms, close relationships often exist with suppliers in their home countries); a high degree of internal integration, as numerous Canadian firms have chosen to backward-integrate to develop their own supply capabilities; government policies that encourage the spreading of industrial development across the country rather than seeking to nurture local industry clusters; and underdeveloped linkages among industry diamonds in Canada. Overall, weak related and supporting industries contribute to the slow pace of technology creation, adoption and diffusion in Canada.

4. FIRM STRATEGY, STRUCTURE AND RIVALRY IN CANADA

A. Background

National circumstances and context strongly influence how companies are created, organized and managed as well as the nature of rivalry among firms in an industry. Firm strategies are affected by the goals and incentives of individuals, managers and shareholders. These, in turn, are influenced by national capital markets, tax structures, and social attitudes. Countries differ in the goals that both companies and individuals seek to achieve.

A striking finding of the ten-nation research was the vital role of domestic rivalry in contributing to international competitive advantage. The dynamism and pressure created

by vibrant local rivalry was the single most important stimulus to innovation and upgrading in a significant number of industries, in both large and small countries. Domestic rivalry provides an essential motivation for firms to make the investments and take the risks necessary for international competitive success. Competition with foreign companies (e.g., through imports) is also a powerful stimulus for a country's firms to improve their competitiveness, but it is rarely an equivalent substitute for domestic rivalry. The presence of local competitors forces firms to develop higher order and more sustainable advantages, which are critical to long term success in international markets.

Healthy rivalry in a country also depends on new business formation through spin-offs, diversification by established firms, and the creation of entirely new enterprises. It is also influenced by competition laws and regulations and by the availability of venture capital and bank financing. Social attitudes toward risk and failure also play a role.

B. Canada's Record

Individual goals in Canada are shaped by prevailing social values, tax policy and other factors. Although the tax burden in Canada is not out of line with most other industrialized countries, it is significantly higher -- especially for those with relatively high incomes -- than in the United States. High taxes can reduce the willingness of talented individuals to work hard, upgrade skills, take risks and even remain in Canada. Surveys have found that compared to the United States, Canadian attitudes toward competition and risk reflect a greater emphasis on security and a weaker attachment to the virtues of competition. This may help to explain the fact that firms in Canada make less frequent use of performance-based compensation incentives than their counterparts in the United States.

Many forces have shaped the strategies adopted by Canadian firms. Factor abundance has nurtured and reinforced an inclination to rely on static, cost-based strategies in many

industries, particularly in the resource sector. As noted in the summary of the industry studies, the strategies favoured by many Canadian firms (particularly in the manufacturing sector) have been marked by an inward-looking focus on the domestic market. More than 70 percent of Canadian manufacturers, for example, do not serve export markets. The tendency to develop overly broad product lines, to vertically integrate, and to diversify into unrelated industries provides evidence that many Canadian firms have preferred the internal market and tended to eschew more outward-looking strategies.

The predominantly insular orientation of Canadian business can be traced to a number of characteristics of the Canadian market. Canada's traditionally high tariffs sheltered industry from external pressure and prompted foreign firms to establish branch plants oriented solely to the domestic market. Weak domestic rivalry in Canada also contributed to inward-looking strategies. High levels of corporate concentration in many sectors, historically weak competition laws, and interprovincial trade barriers have all dulled domestic rivalry. These structural characteristics have helped Canadian firms to achieve strong profitability levels. For example, return on capital in Canada ranked second only to the United States among G7 countries between 1980 and 1990. In many cases, weak rivalry has translated into higher consumer prices for goods and services.

5. IMPACT OF GOVERNMENT ON THE DETERMINANTS

The state has played a vital role in shaping Canadian economic competition and development. This has magnified industry's dependence on government, contributed to the creation of systemic barriers to innovation and upgrading throughout the economy, and reinforced the role of basic factors in sustaining competitive advantage in many Canadian industries.

A. Government's Impact on Factor Conditions

Despite a myriad of government initiatives and high levels of expenditures, the effectiveness of government programs in stimulating the upgrading of factor conditions has often been disappointing. Governments in Canada have frequently responded to pressure from industry and other constituencies to sustain low input costs in areas such as energy and transportation. Subsidies have often been used to spur development; the multi-billion dollar federal support to the Hibernia oil project is a noteworthy recent example. Governments in Canada have often failed to leverage private sector support to upgrade factor conditions. In science and technology, government has provided substantial funding, but commercial relevance, which is critical to attracting private sector support and participation, has typically been a secondary consideration.

Labour market policies have relied heavily on passive measures such as income support through unemployment insurance, and paid relatively little attention to the need to encourage skills upgrading, flexibility and mobility. For example, about three-quarters of Canada's labour market expenditures are directed to income support and one-quarter to training and employment creation. In Sweden, the ratio is almost the opposite, with 70 percent of expenditures directed to training and skills upgrading and just 30 percent to income support. Fortunately, recent federal government initiatives to devote more resources to training the unemployed are moving in the right direction.

B. Government's Impact on Demand Conditions

Governments influence demand conditions in two main areas: government procurement, and the setting of standards and regulations. Government procurement has been an important economic policy tool in Canada, with the public sector spending roughly $100 billion annually to purchase goods and services (mostly from Canadian firms). The overall

effectiveness of government procurement in stimulating innovation in Canadian industry has been diminished by several factors: reliance on design specifications rather than performance standards, interprovincial trade barriers and provincial preferences that have limited competition for contracts, and an orientation to "off-the-shelf" purchasing. Encouragingly, however, commitments to enhance competition in procurement have recently been made by both federal and provincial governments.

Stringent standards and regulations for product performance and environmental impact can create and upgrade competitive advantage by pressuring firms to improve product and process quality. Further, standards that anticipate international trends often have particularly beneficial effects. Canada's record in creating more sophisticated demand through strict, anticipatory standards and regulations is mixed. With some exceptions, environmental standards have rarely been at the forefront of international practices, with the result that industries such as pulp and paper are having to undertake substantial investments simply to catch up. Recent trends in federal and provincial environmental regulation and legislation, however, reveal a greater commitment to impose stricter standards. In addition, Canadian standards in the area of product safety have often been stringent and anticipatory of trends elsewhere, and have thus been a source of competitive advantage for Canadian businesses. For example, Canada was among the first countries to establish a comprehensive set of toy safety standards in the early 1970s. In addition, Canadian life insurance companies and banks have acquired an excellent reputation for probity and stability, in part because of strict financial regulations of the industry.

C. Government's Impact on Related and Supporting Industries

Rather than actively encourage cluster formation and the "natural" growth of regional economies, government regional development policies in Canada have often been geared

to fostering "sameness" throughout the country and to promoting economic diversification unrelated to regional strengths. In particular, government efforts to distribute manufacturing and technology development among the regions have directly inhibited cluster formation, dispersed government resources in an inefficient manner, and made it more difficult for Canadian industry to achieve competitive advantage. A good example was the creation of microelectronics centres in almost every province in the early 1980s -- a policy which did little to strengthen Canadian industry's capabilities in this area. In the end, all but two of the centres were forced to close because of inadequate funding. Another striking example is the division of most large federal government defence contracts among firms in various parts of the country.

D. Government's Impact on Firm Strategy, Structure and Rivalry

Historically, many government policies have helped to foster the insular orientation of Canadian industry noted earlier. In the case of Canadian firms, high tariffs, innumerable interprovincial trade barriers, significant government ownership of commercially-oriented firms, the regulation of large sectors of economic activity by the state, and -- until the mid-1980s -- very weak competition laws all worked to diminish rivalry and slow innovation and upgrading. At the individual level, relatively high marginal tax rates compared to the United States, and a broad social safety net, may have reduced incentives to expend greater effort or upgrade skills.

In recent years, a number of initiatives have been taken, particularly at the federal level, which promise to have a positive effect. The Canada-United States Free Trade Agreement, which has been a powerful catalyst in favour of competitiveness, will strengthen competition in the domestic market and spur more Canadian firms to participate in international markets. Liberalization of Canadian foreign investment rules will have the same effects. Complete or partial deregulation of several key economic

sectors -- including energy and some aspects of financial services and transportation -- will result in more competition and lower costs for a wide range of Canadian industries that purchase the outputs of regulated industries. The modernization of Canadian competition laws in 1986 represents a major step toward a more competitive Canadian marketplace. Privatization of a significant number of Crown Corporations previously active in commercial markets has also improved the competitive environment for firms in Canada. On balance, federal tax reform initiatives since the mid-1980s have improved incentives and efficiency by lowering tax rates, broadening the tax base, and removing the manufacturers' sales tax that undermined the competitiveness of Canadian manufacturing and exports.

Despite these initiatives, much remains to be done to strengthen competition and improve incentives for innovation, investment and upgrading. Many impediments to the free flow of goods, services, capital and people within Canada remain in place. Further steps toward deregulation of key infrastructure industries are needed to improve the competitive environment for Canadian firms. Although government trade promotion programs have been well received by the Canadian private sector and are quite effective, getting more Canadian firms -- especially small and mid-sized companies -- directly involved in international business must remain a priority.

PART IV

DIRECTIONS FOR CHANGE

1. THE COMFORTABLE INSULARITY OF THE OLD ORDER

The preceding section presents a picture of an economic system that had served Canada well in many respects, but leaves the economy ill-equipped for the future. This old economic order was an internally consistent system in which the determinants were mutually consistent and reinforcing. This makes change exceedingly difficult.

Canada's abundant factor resources have been the bedrock of the economy. In many cases, these resources allowed Canadian firms to be profitable by exporting relatively unprocessed commodities rather than through upgrading. Strategies based on basic factor advantages often limited the demand for advanced technology. This in turn constrained investment in R&D and demand for highly skilled employees, which was reflected in enrolment patterns in universities and in the nature of educational programs. The virtual absence of leading-edge related and supporting industries inhibited another possible source of technology.

These tendencies spilled over into other sectors of the economy where Canada did not have such advantages. Many firms, insulated from external and internal rivalry, were content to exploit the profitable home market. The rate of innovation was slow. What emerged was a tendency to administer existing wealth rather than to invest vigorously to create new wealth.

2. GOVERNMENT'S OVERALL EFFECT ON THE OLD ECONOMIC ORDER

Government's proper role is to challenge and raise the sights of industry by improving the quality of the inputs that firms draw upon, and creating a competitive context that promotes upgrading. Effective government policies create an environment which stimulates companies to gain competitive advantage, rather than involving government directly in the process.

As we have discussed, government policies in Canada have often not measured up. Those policies that have most hampered competitiveness in the Canadian economy can be grouped into a small number of major themes that are outgrowths of the old economic order.

i) **Insulation from external and internal competition:** Historically, considerable effort has been directed at insulating the Canadian economy from external pressures by protecting firms from international competition and safeguarding national autonomy. Similarly, weak competition policies were a natural outgrowth of the view that companies had to be large to compete with foreign firms.

ii) **Forestalling the need for upgrading:** Canadian government policies have often sought to remove the need for upgrading rather than encourage it. Artificially constrained factor input costs -- in industries as diverse as transportation, hydroelectric power and agriculture -- lessen pressures for upgrading and reflect a static, cost-based conception of competition. In fact, it could be argued that the current Canadian preoccupation with bringing down exchange rates is a reflection of the same mindset.

iii) **Direct intervention instead of business action:** Canadian governments have had a strong tendency to intervene directly in competition rather than stimulate upgrading

by industry itself. In many policy areas, particularly in science and technology, and education and training, private sector participation has not been well leveraged. Direct intervention in the form of subsidies and bailouts has also been a prominent feature of the Canadian economic landscape.

iv) **Programs to distribute wealth and improve welfare needlessly undermine the economy:** There is a strongly held belief in Canada that all citizens have a right to essential services such as health care and education, a minimum standard of living maintained by social welfare programs, and the opportunity to be employed. Yet the implementation of programs has often proven counter-productive. Canada's commitment to employment has frequently been used to justify protective strategies that preserve jobs in the short term, but simultaneously distort rivalry and delay necessary adjustment. In addition, the effectiveness of the substantial resources devoted to the task of narrowing regional economic disparities has often been undermined by programs which emphasize diversification rather than building on regional strengths.

v) **Conflicting government policies and objectives:** No one level of government in Canada controls a full set of variables in any given policy area, which complicates the process of policy development and implementation. A high level of policy co-ordination is necessary to make Canada's decentralized system work, but such co-ordination has been lacking. For example, in labour market programs, the provinces set and enforce employment standards, while the federal government maintains responsibility for training and unemployment compensation. Furthering Canada's science and technology capabilities has also been hampered by a lack of co-ordination between federal and provincial research bodies. Jurisdictional overlap has often added a layer of complexity and compounded the level of uncertainty that firms face in anticipating changes in the business environment.

3. A FOCUS ON DIVIDING UP THE PIE

Canada's wealth has allowed Canadian firms, labour and governments to all achieve their respective goals without major change or sacrifice. This wealth provided little incentive for labour, management and government to work together to improve national competitiveness. The motivations of different constituencies have often focused on capturing a larger share of existing wealth rather than working together to increase it. Significant chasms now exist between the three constituencies and within government itself. The relationship between labour and management has often been confrontational. At the same time, management has seldom treated labour as partners. Labour and government have also not worked well together, with labour often taking on an adversarial role with respect to many aspects of economic policy, while governments' relations with their own work force have also sometimes been strained.

Canadian companies have sought government assistance in export promotion, investment in specialized infrastructure, government procurement, and other forms of support. They rarely have co-operated, however, with governments in areas that have important impacts on international competitiveness, such as R&D, training, and education. The federal and provincial governments have struggled over roles and mandates. This has led to conflicting and overlapping programs that have worked to the detriment of the economy.

These attitudes and behaviours reflect the old competitiveness paradigm. Business acted as if economic rents would go on forever and moved to exploit the sheltered Canadian market. Labour acted as if jobs and high and rising wages could be taken for granted, because business profits were high and secure. Governments held the view that ample resources would continue to exist to fund social needs.

4. FORCES OF CHANGE

As we have seen in our discussion of the determinants of competitive advantage, the Canadian economy is coming under increasing external pressures. Forces of change are disintegrating the old order. New competitive realities -- including globalization of production, finance and markets, accelerating technological change, lower tariffs worldwide, and free trade between Canada and the United States (and perhaps Mexico) -- call for a more dynamic and flexible set of responses than those typical of the old Canadian order. Canada's future competitiveness, therefore, must be driven by a new paradigm, based on productivity and innovation.

Major structural adjustment in Canada is inevitable. The question is whether the adjustment is positive or whether it leads to an erosion in the standard of living. Also at issue is how long and painful the restructuring process will be, even if business, labour, and government move in the right direction. How long will it take for Canada to transform itself from the old paradigm to a new one? And how much will it cost?

As external pressures are increasing, Canadian firms are beginning to experience greater internal pressures. This is due partly to a number of government policies that are increasingly oriented toward providing a more challenging competitive domestic environment, and partly as a result of positive initiatives taken by firms themselves.

At the federal level, positive government steps include the recently strengthened competition laws, privatization of crown corporations, and efforts to deregulate industries, including energy and transportation. Government is also beginning to employ policies that encourage, and even pressure, firms to upgrade. Tax reform has reduced past distortions, and generous R&D incentives are in place. Increasing the private sector's commitment to training is at the heart of the federal government's new Labour Force

Development Strategy. Reform of Unemployment Insurance has improved incentives to upgrade skills and return to the workforce, though more must be done. In the area of science and technology, a rising number of government programs are being oriented to priorities driven by the private sector.

In response to the significant external and internal pressures facing the economy, we have also seen signs of positive change in a number of industries studied, including industries in the resource sector. For example, Inco has taken significant steps to upgrade its mineral extraction and smelting technologies and improve labour-management relations. A number of companies in the pulp and paper sector are beginning modernization programs. Other firms have begun to reposition their activities in light of intensified competition by becoming more focused and effective producers.

5. SYSTEMIC BARRIERS TO CHANGE

With increasing external pressures and some positive internal initiatives, one might be tempted to believe that Canada's weaknesses will be corrected naturally. However, the vestiges of the old economic order in Canada have imposed significant barriers to upgrading. These barriers are systemic, not isolated. They reside in policies, institutions, and attitudes that permeate the economy. The challenge is heightened by the fact that the diamond is an interdependent system, in which the weakest link constrains progress.

While some necessary steps are being taken, the current extent of change is inadequate. Our analysis of the determinants of competitive advantage in Canada revealed both tangible and intangible barriers to upgrading. Though each industry has a unique diamond, the strength of which is driven by features specific to that industry, virtually all industries we have examined are affected by at least some of these barriers.

Canada's workforce is not well equipped for upgrading and change. The basic skill levels of many citizens are inadequate, in spite of high per capita spending on education. Shortages exist or are looming in skill- and technology-related occupations. Specialized skill development is lagging due to poor vocational apprenticeship training and weak links between educational institutions and industry. Finally, company investments in training are low compared to other industrialized countries.

Canada's R&D infrastructure is not well aligned with requirements for upgrading. Too much R&D spending takes place through government laboratories. The links between publicly funded research institutes and industry are poorly developed. The supply of highly qualified personnel may be inadequate for future research needs.

The level of sophistication of Canadian home demand also works against upgrading. Weak related and supporting industries, as well as inadequate cluster development, constrain innovation and new business formation in Canada. The lack of Canadian process equipment manufacturers is particularly striking and contributes to the weakness in process technology development and adoption in this country.

Firm strategies and structure and the extent of local rivalry in Canada have done little to enhance domestic productivity. Too many Canadian firms continue to maintain an insular focus, concentrated almost exclusively on the domestic market. Finally, a number of Canada's "safety net" programs continue to diminish personal incentives to upgrade skills.

In many ways, however, the most significant barriers to upgrading are attitudinal. Too often, the old mindsets are still in place in business, labour, and government. Canadians still see competitiveness in terms of the old paradigm, which points to inappropriate responses to the current difficulties.

6. THREATS TO CANADIAN INDUSTRIES

The forces we have described in general terms can be translated into specific threats in the broad categories of Canadian industries identified earlier. These individual threats differ from group to group, though their underlying causes and implications are similar.

Resource-Based Industries

Given its abundant factor endowments, Canada's heavy emphasis on resources is not surprising. Yet the sustainability of these industries' competitive advantage is in question. Depletion of resources is a threat to both renewable resource industries, such as fisheries, where a number of factors can upset projected equilibrium levels, and non-renewable resource industries, where new sites are often more remote and therefore more expensive to exploit.

Canada's biggest problem is likely the emergence of lower cost competitors. Basic factor advantages are increasingly replicated by countries such as Venezuela in aluminum, or Brazil in pulp and paper. Apart from the resource costs themselves, Canada does not generally have strong cost positions in activities that are driven by labour rates, productivity, or the age and efficiency of capital stock. In these areas, Canada has often failed to make the necessary investments, such as upgrading process technology to increase the efficiencies in production, that would yield a stronger position. Unless Canada upgrades its resource-based industries, it will be trapped in segments where investments tend to be inflexible and where its marginal costs are higher than major competitors'.

Market Access-Based Industries

Many of Canada's market access-based industries, initially spawned to overcome high tariff barriers, are seriously threatened by the increasingly open trading environment. As trade barriers continue to fall, market access no longer requires a major production base in Canada. Many firms are now in the process of reconfiguring their North American and, in some cases, global operations. Some have made decisions to move production out of Canada, taking with them not only jobs, but also valuable skills and expertise.

One particulary unattractive aspect of many Canadian industry diamonds is interprovincial barriers to trade. By moving to the United States, firms may encounter virtually no penalty in terms of access to other Canadian provinces, given present trade barriers between provinces. Clearly, if effective barriers remain, firms that choose to stay in Canada are unlikely to invest as much in upgrading their existing domestic facilities than if these barriers were removed.

Innovation-Driven Industries

Canada's innovation-driven industries are tangible proof that Canada can achieve an innovation-driven economy. Yet these industries may also be at risk. Firms that have prospered in spite of weak Canadian clusters may find this weakness increasingly eroding their competitiveness. Firms in such industries may move their home bases outside of Canada to take advantage of more favourable diamonds elsewhere. Even those Canadian industries within strong clusters are at risk because of systemic barriers to upgrading discussed earlier.

7. MOVING TO A NEW ORDER

We believe Canada is at an economic turning point. Its old economic order is outmoded and in the process of being dismantled. Canadians can respond in one of two ways. One path is to cling to the old order and actively resist the process of change. The other is to continue building on recent economic reforms and seek to further the process of systemic adjustment in the economy. We are convinced that this second path will better ensure Canada's continued prosperity in the fast-changing global economy. Moving to a new economic order will be uncomfortable for many and actively resisted by some. Inevitably, it will involve short-run costs. Yet we are persuaded that these costs are less than might be supposed. It is not that Canadian business and government must spend more, but that they must act and spend differently. More importantly, however, the shift to a new economic order will require a different mindset on the part of government, business, labour and many individual citizens, one which recognizes and adopts a new paradigm of competitiveness.

The mandate of this study has been to diagnose the state of competitiveness in Canadian industry and highlight key priorities for change. We have not sought to generate detailed policy recommendations. The task of fashioning specific policies and responses must fall to Canadian policy-makers and private sector leaders themselves. The final part of this study seeks to provide some guidance by outlining a new economic vision for firms, labour and governments. We begin, however, by briefly reviewing Canada's major economic strengths.

8. STRENGTHS TO BUILD ON

As it faces a shifting competitive environment, Canada is in the favourable position of having a solid foundation on which to build. In particular, Canada is in many respects

better placed to respond to changing global competition than other resource-rich countries such as Australia and New Zealand. Canada has a large export sector that accounts for more than one-quarter of GDP and represents a significant share of world trade. It also enjoys preferred access to the world's largest and richest economy, the United States. Canada has a large, diversified natural resource base, and ranks among the world's leaders in a range of renewable and non-renewable resources. It also benefits from having a relatively young and well educated labour force.

Many Canadian firms have proven that they can compete in global industries. Canada's success in a number of highly contested global industries -- including telecommunications, consulting engineering, and nickel -- illustrates the intrinsic potential for continued prosperity. Canadian firms have proven that they can compete on the basis of innovation. Northern Telecom, CAE Electronics, Inco and Canstar are a few examples of firms examined in our research which are at the leading edge of technological sophistication in their industries. They have built and sustained internationally competitive positions through a commitment to R&D and technology adoption. They have created and drawn upon strengths in their home diamonds to achieve international success. Innovation and upgrading are at the core of their business strategies.

There is, in short, a foundation in place in Canada that should allow more firms and industries to achieve sustained advantage in international competition. Canadian industry enjoys a good basic infrastructure, a core of university and other research capability, and an educated human resource base with demonstrated potential. The challenge is to redirect government policies and company strategies to develop and build upon these strengths. Free trade will play a positive role here. With the advent of the Canada-United States Free Trade Agreement, Canadian firms can increasingly benefit from proximity and ready access to the United States market. The United States represents not only a significant and growing export market, but also a source of products, technology and

ideas. Free trade will hasten the process by which the Canadian economy specializes in those areas where it performs best, thereby boosting productivity. At the same time, Canadian firms will be able to tap selectively into stronger United States diamonds to overcome weaknesses in Canada's competitive context in areas such as home demand conditions and related and supporting industries -- although, as we have stressed, this is not a panacea.

9. ELEMENTS OF AN ECONOMIC VISION

We believe that a new vision for the Canadian economy is needed, one in which Canada's natural resource abundance is fully exploited, in which firms and governments focus on creating advanced skills and technology, in which sophisticated home demand drives more firms to create advanced products and processes, in which many more Canadian firms compete globally, and in which competition provides a key stimulus for continual upgrading. This does not mean that Canadian firms must compete in different industries than they do today. But it does suggest that they will have to compete in different ways. Firms in Canada need to employ different and more effective strategies, rely on more advanced methods and technologies, and migrate into more sophisticated segments of their industries. In cases where industries cannot be upgraded, resources should flow to more productive uses.

While many specific steps are necessary to raise productivity and improve the dynamism of the economy, we believe that a new economic vision for Canada is best defined in terms of a small number of overarching imperatives:

- **Become an innovation-driven economy.** Innovation -- in its broadest sense -- is the critical requirement for economic upgrading and increased prosperity. Canadian

enterprises in all sectors must move to develop innovation-based advantages. This includes firms in non-traded service industries as well as in the traded sector. Governments must align their policies to support this strategic objective.

- **Increase the sophistication of the natural resource sector.** Resource-based industries have been and will remain a mainstay of Canada's economy. But threats exist to the sustainability of Canada's position in many resource-based industries -- threats such as declining real commodity prices, the emergence of low-cost foreign suppliers, and technologically-driven changes in end-markets. In the future, Canadian resource producers will be under unprecedented pressure to increase productivity, use more sophisticated technology and specialized skills, and develop more sophisticated and differentiated products.

- **Tackle barriers to upgrading throughout the economy**. Eliminating barriers to upgrading productivity must be a priority for firms and governments. Strategies to develop more advanced and specialized factors must be implemented. Incentives must be shifted, wherever possible, to encourage a greater focus on work, investment and skill building.

- **Build on Canada's regional strengths.** Many government policies in Canada have put a higher priority on economic diversification than on competitive advantage. A different concept of regional and industrial development is needed, one that focuses on building industry clusters where they already have established or nascent strengths.

- **Move quickly and decisively to achieve complete free trade within Canada.** The fruits of greater specialization will not be fully realized unless Canada becomes a true single market. Competitiveness in a variety of industries has been hindered by the

existence of internal non-tariff barriers to trade, investment and labour mobility. These have worked against the development of sufficient scale in some industries and dulled the rivalry necessary to achieve competitive advantage. It is encouraging that the federal government's recent proposals for constitutional reform promise to move toward internal free trade and a strengthening of the Canadian economic union.

- **Transform foreign subsidiaries into home bases.** Given its high levels of foreign investment and large number of branch plants (especially in manufacturing industries), transforming foreign subsidiaries into home bases is one of the most critical challenges facing Canada in the 1990s. Branch plants whose sole raison d'être has been to serve the Canadian market will relocate if their productivity does not match or exceed operations elsewhere. Multinationals will make choices about where to make investments in new skills, technologies and product lines according to whether or not the Canadian environment is conducive to innovation and productivity growth.

- **Create and maintain a supportive and stable macroeconomic climate.** Finally, sound macro-economic policies are central to any vision of a competitive, dynamic Canadian economy. Fiscal, monetary, tax and regulatory policies should all be geared to attaining low inflation, balanced and manageable public finances, and a stable overall economic climate. This will result in a lower cost of capital, encourage investment, and neutralize the tendency for companies to be distracted by exchange rates and interest rates instead of concentrating on the true underpinnings of long-term competitiveness.

10. IMPLICATIONS FOR CANADIAN FIRMS

Business, labour, governments and other public sector institutions must all play a role in responding to these imperatives. A particularly heavy responsibility, however, falls on

companies and their managers. Firms, not governments, are on the front lines of international competition. Forced to compete in a more global, open, and fast-changing environment, Canadian firms must focus on setting strategies that will allow them to create and sustain competitive advantage. They should move now to re-examine their strategies, not wait for government or outside forces to intervene. While each Canadian industry will present different challenges, many firms will need to take steps in several important areas.

A. Assess the Canadian Diamond

Canadian firms must begin by understanding their competitive position by product area as well as how their Canadian home bases create competitive advantages and disadvantages. In analyzing their competitive position, the most formidable international competitors in an industry should be the key reference points. Internationally successful firms, as well as the national diamonds in which they are based, provide the benchmarks against which Canadian conditions must be assessed. Canadian companies should be addressing the following questions:

- **The boundaries of the home diamond:** What are the geographic boundaries of the "home" diamond? Does it appear to cross the border with the United States and, if so, what are the key differences for firms operating on either side?

- **Sustainability of basic factor advantages:** How sustainable are Canadian advantages in raw materials, electricity, or other natural endowments? To what extent does the firm rely on explicit or implicit subsidies rather than real factor advantages? How are evolving international trade rules and foreign circumstances likely to alter existing advantages?

- **Quality of human resources:** How does Canada compare in terms of specialized skills relevant to the firm's industry? Are Canadian workers as well trained and well motivated as their foreign counterparts?

- **Technology access:** Where does Canada stand in specialized technologies related to the industry? Are there research institutes or programs in Canada that will assist Canadian firms to innovate?

- **Infrastructure access:** How supportive is Canada's basic and specialized infrastructure in terms of the requirements for competitive advantage in the firm's industry? How does Canada compare with other countries?

- **Canadian demand sophistication:** Is Canadian demand for the firm's products/services sophisticated? Does it anticipate international needs?

- **Supplier access:** Compared to foreign rivals, does the Canadian firm have better or inferior access to local suppliers in important technologies?

- **Related industries:** What are the related industries that will most influence industry competition? What strengths does Canada have in these industries?

- **Competitor diamonds:** Who are the most significant foreign competitors in the industry? What is the state of their diamonds?

- **Potential entrants:** Who are the emerging potential entrants? What is their cost position? How dependent are they on low-cost natural resources, inexpensive labour, or government support?

- **Capacity for differentiation:** What are the sources of differentiation relative to rival firms? Are there products or segments in which the Canadian firm is more innovative?

B. Move Toward Innovation-Driven Advantages

Many Canadian firms have long pursued static, cost-based strategies in which they produce "me-too" products and depend on factor costs or pure scale to provide advantages. A large number of such firms are now under pressure from foreign rivals with more efficient processes or cheaper basic factors. To respond to these challenges, firms need to compete in more sophisticated ways. A broader, more dynamic view of cost makes sense for many firms. More investments must be channelled into efficient and innovative processes to increase productivity. Firms facing low-cost foreign competitors may need to re-orient their strategies from producing unprocessed and semi-processed products (where competition is necessarily based on cost) to more highly processed and differentiated products in related segments.

C. Focus on Areas of True Competitive Advantage

After looking at these issues and questions, many Canadian firms will conclude that they should adopt more focused strategies. In a world of soft economic competition and tariff protection, the proliferation of product lines and businesses may have made sense. The new imperative is to focus on those product lines, market segments and businesses where Canadian firms can achieve sustainable advantage. Often, this will call for a rationalization of product lines and a concentration on lines that draw on unique competitive strengths. A number of firms in Canada have begun this process. GE Canada, for instance, has narrowed its Canadian product line and increased production of selected products to supply other GE operations worldwide. Similarly, Culinar, a

Quebec-based consumer snack food producer, has moved to reduce the breadth of its core product line, divest weaker peripheral businesses, and focus on areas of advantage.

In addition to rationalizing product lines, many businesses will need to re-evaluate their degree of vertical integration and exit from products where vertical integration does not provide advantage vis-à-vis rivals. For some companies, a re-evaluation of growth-through-diversification strategies will also be required. In a world of more open trade and tougher competition, a greater focus on core businesses will make sense for most firms.

D. Upgrade the Canadian Diamond

Upgrading the Canadian diamond takes on special importance as firms move toward more sophisticated business strategies. Canadian firms need to act in several areas:

- **Increase investment in specialized human resource development:** Like any asset, employees at all levels require investment to keep them up-to-date. In an environment characterized by more open competition, Canadian firms will have to rely more on advanced skills and improved labour force productivity and less on traditional basic factor advantages.

- **Forge closer ties with educational institutions:** Canadian firms must take a more pro-active approach if they want educational institutions to produce employees with both the general and specialized skills required for competitiveness. Canadian business, like its counterparts in Germany and several other countries, should be providing more direct input into course development at universities, colleges and technical institutes. Business in Canada should be looking at ways to enhance the status of community colleges to ensure they are not viewed as "second-best" alternatives. Firms should also actively promote and participate in more co-operative

educational programs, where students work part-time or alternate periods of work and schooling. More businesses are becoming involved with co-op programs. For example, Inco entered into a partnership with Cambrian College in Sudbury to develop an innovative 48-week course that combines academic studies with training at Inco.

- **Improve technology development and adoption:** Firms should also be playing a more active role in ensuring that work conducted at university research institutes or centres and government laboratories is commercially relevant. Many successful firms contract out a great deal of their basic research and perform applied and developmental research in-house. Unfortunately, Canada has few specialized "centres of excellence" within its universities or community colleges where leading-edge research takes place, where the world's best professors come to teach, and where students are attracted from around the world. Firms should consider jointly funding and influencing the research conducted in such centres through trade associations, with related industries and with government.

- **Transform trade associations into factor creating mechanisms:** For the small- and mid-sized enterprises that dominate in many sectors of the Canadian economy, the need to upgrade in the areas of human resources and technology development and adoption may appear to pose daunting challenges. Co-operative ventures can be a fruitful path to upgrading factor capabilities for such companies. For example, firms can expand technical assistance and provide more funds to trade associations to develop training programs relevant to their industry. They can support the development of training consortia in which labour and government may participate as partners to industry -- as has recently taken place in the electrical/electronics industry. Trade associations can also be a critical liaison between industry and educational institutes in helping to ensure the relevance of curricula discussed above. Finally, in the area of technology development and adoption, trade associations can also

represent a valuable clearing house for dissemination of pre-competitive research into common areas of concern such as the environment.

- **Nurture Canadian supplier industries:** The absence of dynamic clusters of competitive industries in Canada has been detrimental to innovation. Many firms have sourced abroad, while others have backward-integrated to compensate for the lack of indigenous supporting industries. Canadian companies should be taking steps to strengthen domestic supplier industries. Encouraging domestic suppliers, through local sourcing and the transferring of technology and skills, has become integral to the strategies of prominent Canadian companies such as IBM Canada and Nova Corporation.

- **Strive to develop and serve demanding Canadian buyers:** Firms should strive to serve the most sophisticated and demanding buyers in their home market. Selling to demanding local buyers will strengthen their ability to compete in global markets.

- **Establish Links with Canadian-based firms in related industries:** Related industries are those linked to an industry by common technologies, distribution channels, skills or customers. Canadian firms should strive to develop links with Canadian-based firms in related industries in order to increase technical interchange and information flows in a variety of areas.

- **Develop labour-management relations centred on productivity:** To improve productivity, many Canadian firms will have to adopt less authoritarian approaches to workforce management and a broader view of employees' potential to contribute to firm goals. Labour should be treated as a partner, not an adversary. Employees should be rewarded for productivity growth, but should also expect to share the pain in periods of economic adversity.

- **Rely more on performance-related compensation:** In structuring compensation schemes, Canadian companies should move toward making both individual and company performance a significant part of remuneration at all levels.

E. Adopt More Global Strategies

More than 70 percent of Canadian manufacturers do not serve any export markets, and the majority of those that do export sell solely to the United States. Canada's reliance on the United States as an export market has grown over the past decade, at a time when globalization of many industries has increased. Given a more open global trade and business environment, firms in Canada need to develop global strategies if they are to compete successfully against foreign rivals in many industries. Competing globally means competing beyond North America. First and foremost, it means penetrating foreign markets both through trade and, ultimately, foreign investment. To succeed in international markets Canadian firms must move more aggressively to satisfy the needs of foreign buyers and establish foreign sales and service channels. They must have the patience to make the investments necessary to build foreign market positions. Northern Telecom's recent acquisition of STC, a U.K.-based supplier of switches and transmission equipment, should enhance Northern's ability to sell into the post-1992 European market.

Competing globally can bring many advantages aside from increased sales. No country has unique advantage in all the determinants of competitive advantage. Firms can selectively tap into sources of advantage in foreign diamonds, both to compensate for deficiencies at home and to exploit unique characteristics abroad. Canadian firms will benefit by serving the most sophisticated and demanding buyers in foreign countries. Given the ease of access to the United States market and the cultural similarities between the two countries, Canadian companies have an unusual ability to benefit from American

buyers. The essential foundations for innovation must be present in the home base, however.

F. Define a North American or Global Mandate

Many foreign-owned or -controlled subsidiaries in Canada are today faced with urgent questions about their future role. Foreign subsidiaries in the manufacturing sector tend to be the firms with the broadest product lines, which overlap with those of subsidiaries in other countries. They also face the need to conform to their parents' global strategy. The potential consequences of a weak Canadian diamond are particularly acute for these firms given the ease and speed with which Canadian operations can be downsized and operations in other countries reconfigured to compensate.

Canadian subsidiaries must try to define a new role that is consistent with the evolving nature of the global strategies being pursued by many of the world's most advanced multinationals. This role is to have the Canadian operation become a North American or global headquarters for a particular product line or business segment, in order to exploit particular advantages and strengths in the Canadian diamond. A number of foreign firms operating in Canada have moved in this direction. IBM Canada, for example, has the worldwide mandate for hardware power supplies. Hewlett-Packard Canada's Edmonton-based Idacom division manufactures computer-based protocol analyzers for the worldwide market, while its Calgary operation has the world mandate for supervisory control and data acquisition software. Campbell Soup is reconfiguring its Canadian operations to fit a North American manufacturing strategy. Canada is taking responsibility for a series of small-batch, specialty product lines that are especially well suited to the small yet flexible Canadian plants. The British firm ICI, after taking full control of its Canadian subsidiary ICI Canada, located the world headquarters for its industrial explosives business in Canada.

G. Redefine the Relationship with Government

Canadian firms must re-evaluate their expectations of government and place different demands on government than in the past. First, they should insist that government activity not substitute for business initiative. Second, they should no longer look to government to provide traditional forms of assistance -- subsidies, artificial cost structures, lax regulations, guaranteed procurement. Third, Canadian firms should pressure government to contribute to competitiveness through the provision of high quality infrastructure, advanced factor creation, and appropriate incentives. Government-assisted R&D centres and training programs, for example, can be significant assets for firms. More generally, Canadian firms should promote government policies that promise to improve the home diamond in the industry or industries in which they compete.

11. IMPLICATIONS FOR LABOUR

With some 37 percent of the labour force unionized, organized labour in Canada plays a significant role in the country's economy as well as in a host of individual industries (especially in the resource and manufacturing sectors). Unions also exercise influence by adopting strategies and objectives that affect workplace relations in the broader private sector. The attitudes, policies and approaches of organized labour can either help or hinder competitiveness. Far-sighted union leaders understand that efforts to increase productivity, upgrade skills and facilitate shifts into more sophisticated jobs are the best guarantee of good wages in the long term.

In the old Canadian economic order, breakdowns in labour-management relations generally carried little cost. Large resource rents were there to be divided. Market protection and weak rivalry allowed cost increases to be passed on. Companies could

prosper without paying much attention to their workforce. Finding themselves in a comfortable competitive environment, many companies accepted wage demands unconnected to productivity performance and tolerated work practices that impeded innovation. These behaviours and attitudes no longer fit the new competitive realities facing Canadian industry. New approaches to labour-management relations are needed. For organized labour, several implications follow from this:

- **Focus on productivity:** Canadian unions have sometimes been hostile to the imperative of productivity improvement, seeing it as a threat to jobs or a veiled attempt to reduce wages and benefits. To varying degrees, they have resisted developments geared to achieving higher productivity -- such as workforce re-organization, multi-skilling, and compensation systems more closely tied to performance. Today more than ever before, the future viability of many Canadian industries and firms depends on their success in upgrading productivity. Unions can make an important contribution by assisting firms to identify and remove obstacles to productivity improvement, by pressing for job enhancement and flexibility, and by supporting advancement based on training and merit.

- **Skills upgrading:** Broadening and increasing workers' skills should be a central objective of labour. In recent years, there have been encouraging signs that unions have come to accept the inevitability of technological change and the necessary skills upgrading that accompanies it. Most of the onus for developing a "training culture" within Canadian business, however, must fall on managers, not workers or their unions.

- **More co-operative labour-management relations:** Shifts in production technologies and increasing competition call for a deeper re-evaluation of the traditional labour-management framework. A more collaborative approach is essential. For their part,

unions should embrace opportunities to participate in firm planning and encourage more information exchange. If Canadian industry is to compete successfully in the future, labour must move beyond its traditional and deeply-rooted inclination to see management as the "opposing team".

12. IMPLICATIONS FOR GOVERNMENTS

Both the ten-nation study and our Canadian research have demonstrated that government can improve or detract from national competitive advantage. The question is not whether government should have a role, but what that role should be. Government's role in shaping competitiveness is inherently partial. Government policies in a particular area will generally fail unless they work in tandem with other determinants of competitive advantage. Government policy should be directed to building the skills, research infrastructure, and other inputs on which all firms draw. Through regulations, tax legislation, competition policies and policies in other areas, government should seek to fashion an environment that supports upgrading and productivity growth. In this section, we summarize the broad implications of our findings for Canadian policy-makers. We begin by outlining several general principles for sound policy, and then focus on a number of specific areas in which changes are needed.

A. Some General Principles

Canadian governments should be guided by a limited number of principles as they seek to develop policies to assist Canadian industries and companies achieve international competitive success:

i) **Encourage adjustment and upgrading:** Competitive success grows out of dynamism, not static advantages such as cheap labour or subsidized input costs. Too often, government policy reflects a static mindset. In the next several years, many industries in Canada will be forced to restructure and re-focus -- rationalizing product lines, exiting from peripheral businesses, shifting away from some industries and segments and toward others. Government should facilitate these adjustments, not stand in the way. This will involve a government commitment to retraining, building infrastructure appropriate to changed circumstances, and providing an overall environment conducive to restructuring.

ii) **Minimize direct interventions:** Direct interventions in the economy often have unfortunate consequences. Ineffective use of expenditures results in wasted resources. In addition, direct intervention frequently leads to an unhealthy dependence on government by industry. Federal and provincial governments should be using indirect means rather than direct interventions to promote competitiveness. Indirect policies encompass programs designed to improve infrastructure and human resources, as well as economic policies that encourage investment and upgrading.

iii) **Rely on incentives instead of grants:** Subsidies and grants to specific firms rarely translate into durable competitive advantage. There is little evidence that governments can successfully "pick winners" by targeting support to particular enterprises. Broader incentives that encourage individuals and firms to upgrade skills, or that create advanced factor pools and improved infrastructure, are more effective policy tools.

iv) **Re-engineer social policies:** In the long run, competitiveness and social goals tend to be mutually reinforcing. More productive industries lead to a stronger national economy, which in turn is better able to meet diverse social policy objectives. At the same time, an effective social infrastructure helps to underpin economic success. The

design of social programs can have profound and often unanticipated consequences for the economy. In New Zealand, for example, a non-contributory pension scheme reduced national savings, while the structure of social assistance payments encouraged young people to drop out of school and militated against skill upgrading. Aggregate social spending in Canada is not out of line compared to most other industrialized countries. However, to create an attractive environment for competitive advantage, it is crucial that social goals be pursued in a way that does not sacrifice incentives, upgrading and productivity growth. Consideration must be given to re-designing social programs that do not meet this test.

v) **Improve intergovernmental policy co-ordination:** Government imposes an increasingly heavy burden on Canada's economy. This burden is magnified by inadequate co-ordination of federal and provincial government policies in areas such as economic management, tax policy, training, education, the environment, and procurement. Canadians today are paying a high price to maintain elaborate bureaucracies at both the federal and provincial levels, yet are not receiving the benefits of either strong central control or effective decentralized decision-making. The ultimate structure of a potentially reformed Canadian confederation is now under active discussion. This subject lies outside the scope of our study. However, we are convinced that improving Canada's international competitiveness will necessitate a substantially greater degree of collaboration and co-ordination between Ottawa and the provinces than has been typical in the past.

vi) **Maintain an open policy toward foreign investment:** We strongly believe that efforts to restrict foreign investment in Canada, or to legislate foreign company behaviour, should be avoided. Except in rare cases, foreign investment contributes to the economy through new products, processes, assets and skills that boost productivity. A substantial body of Canadian research supports this view. Foreign-

owned companies are often more efficient and more technologically advanced than domestic firms; many invest as much, if not more, in R&D as their Canadian counterparts. However, while Canada is better off with foreign investment than without it, the existing pattern of foreign activity in the economy reflects weaknesses that are cause for concern. Because of deficiencies in Canadian industry diamonds, foreign operations in Canada are too often limited to sourcing raw materials or performing the minimum activities needed to gain access to the local market. An important objective of government economic policy must be to improve the Canadian economic environment so that foreign companies will, over time, change and broaden the nature of their Canadian activities.

vii) **Promote a sound and stable macroeconomic environment to complement other initiatives:** While a stable macroeconomic environment assists in achieving international competitiveness, it does not create or ensure it. Devaluing Canada's currency also does not provide a long-term solution to the country's underlying competitiveness problems. There is, however, little doubt about the types of macroeconomic goals that governments should be setting in order to support competitiveness: low inflation, which works to lower the real cost of capital; a high rate of national saving; and balanced public sector finances. The size of government deficits, and the rapid growth of government debt which has resulted from many years of large deficits, is perhaps the most critical macroeconomic problem facing Canada today. Chronic public sector deficits contribute to higher inflation, interest rates, and taxes. Determined action to reduce government deficits is imperative if Canada is to compete successfully through the 1990s and beyond.

B. Priorities in Specific Policy Areas: Factor Conditions

The number of government policies that affect the competitiveness of a country's industries and firms is almost limitless. Based on our Canadian research, we have identified some specific priorities for improvement in each part of the Canadian diamond. Because Canadian competitiveness has been mainly rooted in factor advantages, government policies bearing on factor conditions are particularly important.

i) Investment in education and specialized skills.

Upgrading human resources will be critical to Canadian firms' ability to become more competitive. Canada has a relatively well-educated workforce, but its education and training systems have failed to respond adequately to the challenges posed by the contemporary global economy. Ensuring that the education system does a better job imparting basic skills is one priority. Improving and expanding private sector training is another. Governments should be considering new initiatives in several areas:

- Provide more training for the unemployed: Recent moves by the federal government to direct a larger share of labour market program funding to training the unemployed are a promising beginning, but more must be done to shift from passive income support to "active" labour market programs that encourage adjustment and skill upgrading.

- Promote private sector training: Canadian firms, in general, spend significantly less on workforce training than their counterparts in other industrialized countries. Governments should consider providing incentives to stimulate more training. One option might be to give UI premium rebates to firms that

undertake training (possibly targeted at small and mid-sized firms). Another option would be to develop tax exemptions or credits to encourage training.

- Set high national educational standards: Canada's relatively generous spending on education has not translated into superior performance. Canada is virtually alone among advanced countries in having no national education standards of any kind. In other countries, such standards are an important ingredient in fostering high achievement. National standards are not inconsistent with a decentralized education system. In Germany, for instance, national standards co-exist with an education system administered by the states, not the central government. A national standard need not require a full-fledged national system for testing, provided an appropriate level of intergovernmental co-operation exists. Provincial governments should move quickly to collaborate in developing agreed standards and testing mechanisms.

- Put more emphasis on practical curricula and science skills: Compared to other countries examined in our research, Canada has relatively few scientists, engineers and technical workers in its labour force. Evidence points to declining interest in the sciences among elementary and high school students, declining enrolment in trade and vocational programs at the post-secondary level, and flat cr falling enrolment in college-based technology-oriented programs. School curricula should be re-designed to put more emphasis on science, mathematics and technology disciplines.

- Expand apprenticeship programs and update curricula: Many apprenticeship programs in Canada suffer from limited access, lack of standardized certification criteria, and high drop-out rates. Co-operative efforts on the part of governments, industry and labour to update apprenticeship programs and

extend such training into more occupations are urgently needed if Canada is to expand its pool of highly skilled workers.

- Work more closely with trade associations: As discussed above, trade associations represent a potentially high leverage mechanism for upgrading Canadian factors, particularly in the areas of education and training. Governments at all levels should seek to work more closely with these associations to strengthen factor conditions.

- Promote co-operative education: Co-operative education programs have proven to be an excellent vehicle for linking education to the workplace and for facilitating the transition from school to the labour force. Participation in these programs should be broadened.

- Align university funding to support competitiveness: As currently structured, government funding mechanisms for universities may not adequately underwrite the cost differentials that exist between science- and technology-related courses and other fields of study. Governments should re-evaluate existing funding mechanisms and take steps to ensure that adequate resources are available for programs directly linked to competitiveness. Provincial governments should also re-examine the appropriate role of tuition in the overall university funding mix and the potential for school autonomy in setting tuition fees. The privatisation of some programs or even institutions should be seriously considered.

ii) **More focused technology development and faster adoption.**

Technology development and adoption are areas where Canada suffers from significant weaknesses. The problem lies more with the private sector than with government, however. Stimulating more research and development and faster adoption of technology in the private sector must be a priority objective of government. Among the specific steps we recommend are the following:

- Improve co-ordination of government R&D programs: Our research revealed a number of areas where excessive fragmentation of government expenditures has limited the effectiveness of science and technology programs. Duplication of research between universities and government labs is also of concern given the overall scarcity of government resources. Expenditures and research efforts in federal and provincial government research organizations must be better co-ordinated and tied more closely to university research activities.

- Forge stronger links among government laboratories, provincial organizations, universities, and the private sector: Government policy on science and technology has attached a high priority to advancing science and to training qualified personnel. While these goals are important, in the future, government policy in this area should put a greater emphasis on fostering more intimate linkages with industry.

- Increase the proportion of government-funded R&D performed in the private sector: While government R&D spending has increasingly emphasized private sector and university performance, federal laboratories still accounted for 55 percent of government expenditures of $2.7 billion in 1990, while provincial laboratories accounted for 41 percent of provincial government expenditures

of $ 664 million. Given the funding issues which currently exist within the university system in terms of science and technology infrastructure, as well as the issues of ensuring commercial relevance and technology diffusion associated with government labs, we believe governments at the federal and provincial levels should continue to reduce the proportion of their funds spent internally, in addition to increasing the linkages with industry with respect to the activities that remain.

- Encourage greater specialization among universities: Current government policies and funding mechanisms often discourage specialization among Canadian universities. To create the specialized skills and other advanced factors necessary to achieve competitive advantage, more specialization in university programs and research activities should be encouraged.

- Expand information available on intellectual property: Intellectual property laws, and the information infrastructure that supports them, play an important role in fostering technology diffusion. The federal government should move rapidly to complete the automation of the patent search process.

iii) **Increase the pace of regulatory reform in infrastructure sectors.**

Regulatory reform in Canada has generally lagged the pace set in the United States. This has resulted in higher service costs to Canadian producers of many goods and services. Canada should continue to move ahead with regulatory reforms in key infrastructure areas such as transportation and communications. In addition, the federal and provincial governments should renew efforts to achieve a greater degree of harmonization of policies that restrict interprovincial competition and rationalization in areas such as trucking.

iv) **Strengthen resource conservation and renewal policies.**

Effective natural resource conservation is vital to sustaining the competitiveness of resource-based industries. Canada's record to date has been mixed, although improvements are evident in areas such as forest replantation. With close to half of Canada's goods sector exports dependent on natural resources, governments must ensure that their resource policies promote long-term conservation, not short-term exploitation.

C. Priorities in Specific Policy Areas: Demand Conditions

Governments have a significant impact on a country's home demand conditions. Their leverage over demand is greatest in the areas of government procurement, regulation of product safety and standards, and environmental standards. The aim of government policy should be to encourage home demand that is early and sophisticated, and that anticipates international needs and trends.

i) **Restructure government procurement.**

The effectiveness of government procurement policy in spurring innovation and competitive advantage in Canada has been undermined by several factors -- blurred policy objectives, provincial government restrictions on out-of-province bidding, and a common preference for off-the-shelf products. Only infrequently have governments acted as a sophisticated buyer and sought to pressure Canadian companies to upgrade, or created an early market for new products. While some progress in reforming procurement practices has been made in recent years, further efforts are required:

- Encourage more open competition for government contracts: Discriminatory purchasing practices, especially at the provincial level, have resulted in significant economic costs. All governments should strive to ensure that competition is open to out-of-province and out-of-country bidders.

- Use challenging performance specifications: Use of "make to blueprint" design specifications still appears to be widespread in government procurement in Canada. Wherever possible, governments should move toward performance-based specifications in order to encourage suppliers to develop and proliferate innovative products and processes.

ii) **Adopt stringent and forward-looking regulatory standards**.

Strict, anticipatory regulatory standards can be a potent force for spurring upgrading in industry, provided they are designed and administered effectively. Strict product quality and safety standards pressure firms to improve products in ways that are eventually demanded by international markets. High regulatory standards in areas such as construction, telecommunications and transportation can stimulate early and sophisticated home demand. Tough standards for energy efficiency and environmental impact trigger innovations in products and processes that are highly valued elsewhere. In all of these areas, governments in Canada should be continuing to move toward more stringent standards and regulations.

D. Priorities in Specific Policy Areas: Related and Supporting Industries

Our research has found that the presence of home-based related and supporting industries is often critical in stimulating and facilitating innovation and productivity growth. The lack of depth and breadth in most Canadian industry clusters represents a significant

weakness as the country and its industries seek to respond to a new competitive environment. Canadian government policy in areas such as regional and industrial development has frequently worked against the objective of building strong, geographically concentrated clusters. Government policies should be tailored to meet the following guidelines:

- Ensure that programs and policies in all areas are consistent with the development of stronger industry clusters: Governments should critically examine the full range of policies to determine whether these policies support the growth of clusters.

- Employ policies that build on existing regional strengths: The presence of an industry or cluster in a region is generally a sign that some competitive advantage already exists. Government policies should be geared to enhancing clusters rather than -- as has so often been the case in Canada -- subsidizing existing, inefficient industries and activities or trying to create industries unrelated to local economic strengths.

- Focus on promoting the development of specialized factors: The most effective way for governments to reinforce cluster development is to focus on investments that assist in creating specialized factors such as technical institutes, training centres, and other infrastructure related to the needs of specific industries. Importantly, many of the policies and programs that most effectively promote specialized factors are provincial or local in origin.

E. Priorities in Specific Policy Areas: Firm Strategy, Structure and Rivalry

Governments can strengthen the competitiveness of their industries by fostering a stable economic environment and creating incentives for investment, skill upgrading and risk-taking, and by ensuring that a healthy degree of competition prevails in the home market.

i) **Create stronger individual and corporate incentives for investment and upgrading.**

Through tax policies and its actions in other policy areas, government helps to structure the incentives for individuals to work, save and invest in skill-building. Government policies also influence the goals and strategies of firms. To strengthen this important determinant of competitive advantage, governments in Canada should be looking at initiatives such as the following:

- Re-engineer "safety net" programs to ensure they are well targeted to those in need and provide appropriate incentives: Some existing social programs should be restructured so that clear incentives always exist for individuals to work and improve skills. In particular, consideration should be given to reforming social assistance programs to allow recipients to keep a greater portion of earnings from employment, thereby encouraging them to participate in the labour force and upgrade their skills.

- Encourage stronger linkages between performance and compensation: Canada currently trails a number of competitor countries in linking compensation to productivity- or firm-performance at both the managerial and worker levels. Governments can assist in promoting compensation linked to performance through its policies toward its own work force and also by encouraging appropriate behaviour in the private sector. Providing further incentives for employees to invest in their companies would be one way to strengthen linkages between pay and performance in the private sector.

- Provide more favourable tax treatment for long-term equity investment: To increase its international competitiveness, Canada must invest heavily in

training, technology, machinery and equipment. Yet the payoff from such investments is often realized only over the long-term. There is concern in Canada (and the United States) that investors -- individual, corporate and institutional -- are often guided by a shorter-term outlook. Current tax policy may contribute to a short-term view. While the tax treatment of capital gains in Canada is somewhat more favourable than that in the United States, this is largely offset by higher marginal tax rates. In addition, a number of other countries have introduced measures specifically designed to encourage long-term investment. We believe that Canada should also be exploring ways to restructure capital gains taxation in order to increase incentives for long-term investment in productive assets.

ii) **Extend efforts to increase rivalry**.

Canada has made significant strides in recent years toward instituting policies that enhance domestic rivalry. Freer trade, deregulation, and the modernization of competition laws are all important steps that have moved the country in the right direction. Now, the federal and provincial governments must make an extraordinary effort to eliminate interprovincial barriers as expeditiously as possible. The federal government's recent constitutional initiative should provide a useful impetus to achieve progress in this field.

iii) **Move aggressively to restore a favourable macroeconomic environment**.

All levels of government must share in the burden of bringing deficits and debt under much better control, by re-evaluating spending programs and increasing the effectiveness of dollars spent. The underlying philosophy of the federal government's recent proposals, contained in its report *Canadian Federalism and Economic Union*,

which calls for increased fiscal co-ordination among the federal and provincial governments, is a sound one and the proposals deserve serious consideration.

Finally, despite recent proposals by some, devaluing Canada's currency is not a long term solution to Canada's competitiveness problems, even if it might temporarily improve the competitive position of some Canadian industries.

13. IMPLICATIONS FOR CANADIAN CITIZENS

Perhaps the most important factor in Canada's ability to move forward is the attitudes and the mindset of individual Canadians. Unless individual citizens can accept and internalize the new reality, positive programs will be undermined.

Canadians must better understand the foundations of their past prosperity, and the fact that the comfortable old order is disintegrating. They must also recognize that the sources of Canadian competitiveness are at risk. Most importantly, Canadians must understand that they cannot return to the old order.

Instead of looking longingly at the past, Canadians must adopt the new paradigm for what will determine future Canadian competitiveness. They must respond to this new paradigm in their roles as employees, as managers, as voters, and as members of their communities.

CONCLUSION

Canada today faces unprecedented challenges to its future economic viability and prosperity. The traditional Canadian economic order, developed over many decades, generally worked well for most Canadians. Now, however, it is under tremendous strain because of sweeping changes in the global competitive environment -- rapid growth of trade and investment, more open competition, the globalization of industries, shifting corporate strategies, rapid technological change, and increased economic integration among countries. The traditional Canadian economic order is less and less able to maintain the high standard of living to which Canadians have become accustomed. While Canadian governments, firms and other constituencies have made some efforts to respond to the new competitive reality created by these developments, the responses so far are unlikely to be sufficient to promote long-term growth and competitiveness.

No simple solutions exist to the competitiveness issues confronting Canada. New competitive realities call for a new paradigm of competitiveness, one that is centrally focused on fostering more dynamism in the Canadian economy. In business, labour and the public sector, new approaches are necessary to create the pressures, incentives and capabilities that will support innovation. The magnitude of the changes affecting Canada's economic environment means that Canadians need to achieve a broad understanding of the issue of competitiveness and work to forge a consensus for action. The emerging national debate on competitiveness provides a welcome opportunity to seek such a consensus.

As its responds to a different and more demanding economic environment, Canada is able to draw upon many strengths. These include a talented and relatively youthful population,

a nucleus of internationally successful firms, the opportunities afforded by proximity to the enormous United States market, and a legacy of past achievements in many fields. These strengths, if complemented by a clearer understanding of the true underpinnings of competitiveness, should allow Canada to successfully tackle the task of building a more innovative and competitive economy for the future.